

Uranium Mines and Deposits in the Grants district,  
Cibola and McKinley Counties, New Mexico

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The purpose of this report is to present a series of maps showing the approximate outlines of uranium deposits and areas of significant mineralization. Mines and prospects are also shown on the maps. The data presented here are intended to supplement McLemore and Chenoweth (1989) and to aid exploration and mining companies in locating and developing these deposits. The data may also be useful for administrators in local, state, and federal government agencies who require this information for environmental studies, land-use decisions, and other planning actions. The data will be updated periodically and ultimately published by NMBMMR in the future and any updates and/or corrections will be greatly appreciated.

The approximate outlines of the uranium deposits were obtained from a variety of sources including published and unpublished reports. Most sources are referenced on each of the maps. In addition to published reports, mine and uranium deposit maps and other data were obtained from a number of mining companies and the files of the U.S. Atomic Energy Commission, Grand Junction (Colorado) Office. Several geologists from various companies review portions of the maps, including M. H. Alief (Chevron Resources Co.), J. Greenslade (retired, Phillips Petroleum Co.), D. C. Fitch and J. E. Motica (Hecla Mining Co.), J. H. Jackson (Santa Fe Mining, Inc.), and H. E. Whitacre (Quivira Mining Co., now Rio Algoma Mining Corp.). George W. Hazlett (retired, United Nuclear Corp.) and Harlen K. Folen (retired, U.S. Department of Energy) reviewed all of the maps and assisted in plotting the oxidation-reduction interface in the Morrison Formation. Warren I. Finch (U.S. Geological Survey) and William Hatchell (New Mexico Department of Natural Resources) also reviewed all of the maps. However, the authors assume full responsibility for the data presented.

Production data for each mine are presented in Table 1 up through 1970. These data were obtained from the U.S. Atomic Energy Commission files. Production data for each mine from 1971 to 1988 are confidential and summarized in Table 2. Additional production data are presented in McLemore (1983a) and McLemore and Chenoweth (1989). Statistics on reserves are from various cited references, however reserve data are not available for most deposits.

The geologic setting, host rocks, size, geometry, and mineralogy of uranium deposits in the Grants district are summarized elsewhere and not repeated here. The reader is referred to McLemore and Chenoweth (1989), Turner-Peterson and others (1986), Rautman (1980), Hilpert (1969), and Kelley (1963) for more information.

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Table 1 - Uranium production 1943-1979 from ore deposits in New Mexico from the U.S. Atomic Energy Commission ore production reports (mill receipts), government contracts only. This includes total ore that was received at the buying stations and mills. Ore grades represent an average of the total shipments V<sub>2</sub>O<sub>5</sub> analyses are incomplete; not all of the ore shipments were assayed for V<sub>2</sub>O<sub>5</sub>.  
<sup>1</sup>Produced unknown amount of uranium ore after 1970 (see table 2). <sup>2</sup>Some of the ore credited to Barbara J #1 may actually have been produced from Barbara J #3.

| Number  | Mine Name                              | Tons Ore  | Pounds U <sub>3</sub> O <sub>8</sub> | %U308 | Pounds V <sub>2</sub> O <sub>5</sub> | %V <sub>2</sub> O <sub>5</sub> | Type of deposit | Host Rock <sup>4</sup> | Periods of Production/Shipper  |
|---|--|-----------|--------------------------------------|-------|--------------------------------------|--------------------------------|-----------------|------------------------|--|
| <b>GRANTS URANIUM DISTRICT</b>                  |  |           |                                      |       |                                      |                                |                 |                        |  |
| <b>Cibola County (formerly Valencia County)</b> |  |           |                                      |       |                                      |                                |                 |                        |  |
| 12N.9W.4.414                                    | Blackhawk and Bunney (Sec. 4)          | 13,934    | 72,996                               | 0.26  | 4,571                                | 0.09                           | limestone       | Jt                     | 1952 - John Dorsett; 1954-M.W. Larsen; 1956-Cheyenne Contracting; 1958-1960, 1962-Sutton and Sutton; 1960-1962-Astro Enterprises; 1963-Sutton and Moe; 1965-1966-Mesa Mining Co.; 1967-Bailey and Fife   |
| 11N.9W.20.414                                   | Cedar (Yucca, Falcon)                  | 3,199     | 13,631                               | 0.21  | 6,461                                | 0.10                           | limestone       | Jt                     | 1952 - Maddox and Teague; 1953-Maddox and Teague; 1954-1955-La Jara Mining Co.; 1955-Falcon Uranium and Oil Co.; 1955-1956-Yucca Uranium Co; 1956-1957-Florida Minerals; 1957-Utco Uranium Corp.   |
| 10N.3W.22.400                                   | Chaves Lease                           | 192       | 821                                  | 0.21  | 2,165                                | 0.56                           | sandstone       | Jmr                    | 1955 - Calumet and Hecla   |
| 12N.9W.4.243                                    | Christmas Day                          | 2,624     | 9,373                                | 0.18  | 5,621                                | 0.10                           | limestone       | Jt                     | 1954-1956 - Colamer Corp.  |
| 8N.5W.8.113                                     | Crackpot                               | 3,214     | 8,396                                | 0.13  | 21,348                               | 0.33                           | limestone       | Jt                     | 1955 - Anaconda  |
| 12N.9W.33.444                                   | <sup>1</sup> F-33 (Sec. 33)            | 48,686    | 304,871                              | 0.31  | 31,306                               | 0.12                           | limestone       | Jt                     | 1954-1959 - Anaconda   |
| 11N.5W.26.35                                    | <sup>1</sup> Jackpile-Paguate          | 9,498,698 | 46,194,350                           | 0.24  | 5,315,237                            | -                              | sandstone       | Jmbj                   | 1952-1970 - Anaconda   |
| 12N.9W.15.411                                   | La Jara (Zia)                          | 3,574     | 31,277                               | 0.44  | 613                                  | 0.52                           | limestone       | Jt,Je                  | 1952 - J.M. Keeney; 1954-La Jara Mining Co.; 1956-Florida Minerals; 1957-1958-Zia Mining Co.; 1960-Chena Mining Co.  |
| 12N.9W.8.224                                    | Last Chance                            | 2,753     | 9,334                                | 0.17  | 12,804                               | 0.26                           | limestone       | Jt                     | 1951 - William Barlow; 1952-F.A. Sutton; 1953-T.H. Skidmore; 1956-F.J. Broadbush   |
| 11N.9W.8.214                                    | Lone Pine                              | 392       | 983                                  | 0.13  | 3,309                                | 0.42                           | limestone       | Jt                     | 1954-1955 - Lone Pine Mining Co.; 1955-Permian Basin Uranium Co.   |
| 8N.6W.16.124                                    | Paisano                                | 9         | 34                                   | 0.18  | -                                    | -                              | limestone       | Jt                     | 1957 - Good News Mining Ltd.   |
| 12N.9W.4  | <sup>1</sup> Red Bluff-Gay Eagle       |           |                                      |       |                                      |                                | limestone       | Jt                     | 1952-1959 - Uranium Development Co.; 1953,1955, 1957,1964-Moise Mirabel; 1953,1955-1957 - W.A. Martin; 1954, 1956 - Amuranium Corp; 1954 - M.L. Larson; 1954 - E and M Mining Co.; 1954 - William and Russell; 1954, 1956 - McElvain Brothers; 1958-1958 - Sutton and Sutton; 1958 - Chena Uranium Co.; 1959-1960 - L.O. Sutton; 1960 - Astro Enterprises; 1962-1953 - Homer Scriven; 1963, 1965-Mesa Mining Co. |
| 12N.9W.4.221                                    | Red Bluff #2,4                         | 2,756     | 10,157                               | 0.18  |                                      |                                |                 |                        |  |
| 12N.9W.4.214                                    | Red Bluff #3,5,9                       | 457       | 1,350                                | 0.15  |                                      |                                |                 |                        |  |
| 12N.9W.4.434                                    | Red Bluff #7,8,10; Gay Eagle           | 41,914    | 168,560                              | 0.20  |                                      |                                |                 |                        |  |
|   | TOTAL                                  | 45,127    | 180,067                              | 0.20  | 49,831                               |                                |                 |                        |  |
| 11N.4W.30.243                                   | <sup>1</sup> St. Anthony (M-6, Hanosh) | 78,722    | 320,942                              | 0.20  | 100                                  |                                | sandstone       | Jmbj                   | 1951 - Hanosh Mines; 1957-1960-St. Anthony Uranium Co.; 1960-American Metal-Climax Corp. (now controlled by United Nuclear Corp.)  |
| 13N.8W.30.243                                   | <sup>1</sup> San Mateo Mine            | 837,110   | 2,847,799                            | 0.17  | -                                    |                                | sandstone       | Jmp                    | 1959-1962 - Rare Metals Corp. of America; 1962-1967 - El Paso Natural Gas Co.; 1967-1970-United Nuclear Corp.  |
| 9N.5W.27.211                                    | Sandy Mine                             | 939       | 2,221                                | 0.12  | 2,579                                | 0.14                           | limestone       | Jt,Je                  | 1955 - Anaconda  |
| 12N.9W.9.120                                    | Section 9                              | 64,424    | 189,778                              | 0.15  | 112,584                              | -                              | limestone       | Jt                     | 1950 - Fred Glover; 1953-1959-Anaconda; 1960-1962-Farris Mines   |

| Number                        | Mine Name  | Tons Ore      | Pounds U <sub>3</sub> O <sub>8</sub> | %U308       | Pounds V <sub>2</sub> O <sub>5</sub> | %V <sub>2</sub> O <sub>5</sub> | Type of deposit | Host Rock <sup>4</sup> | Periods of Production/Shipper  |
|-------------------------------|--|---------------|--------------------------------------|-------------|--------------------------------------|--------------------------------|-----------------|------------------------|--|
| 12N.9W.11.334                 | Taffy (Bonanza)  | 110           | 362                                  | 0.16        | —                                    | —                              | sandstone       | Jmp                    | 1961 - Lummus and Muriel   |
| 11N.9W.4.411                  | Tom 13   | 32            | 169                                  | 0.26        | 315                                  | 0.49                           | limestone       | Jt                     | 1954-1955 - Anaconda   |
| 12N.9W.4.442                  | UDC #5   | 927           | 3,091                                | 0.17        | 1,375                                | 0.07                           | limestone       | Jt                     | 1953-1954 - Uranium Development Co.  |
| 11N.5W.35.341                 | Watter   | 319           | 2,643                                | 0.41        | 2,184                                | 0.34                           | sandstone       | Jmbj                   | 1952-1953 - Anaconda   |
| 11N.5W.35.100                 | Windwhip   | 2,788         | 17,325                               | 0.31        | 9,298                                | 0.17                           | sandstone       | Jmbj                   | 1954 - Anaconda  |
| 11N.5W.36.443                 | Woodrow  | 5,326         | 134,014                              | 1.26        | 4,895                                | 0.05                           | breccia pipe    | Jmj;Jmb                | 1953-1956 - Anaconda   |
| <b><u>McKinley County</u></b> |  |               |                                      |             |                                      |                                |                 |                        |  |
| 14N.11W.5.313                 | Alta (Section 6)   | 3,330         | 27,212                               | 0.40        | 13,719                               | 0.35                           | sandstone       | Jmw                    | 1951-1957 - Anaconda; 1960-Farris Mines, Inc.; 1961-L.O. Sutton, Jr.; 1966-Henry Andrews   |
| 14N.9W.28.144                 | <sup>1</sup> Ann Lee (Section 28)  | 1,116,729     | 5,032,647                            | 0.20        | —                                    | —                              | sandstone       | Jmw                    | 1958-1963 - Phillips; 1963-1970-United Nuclear   |
| 13N.9W.30.213                 | <sup>2</sup> Barbara J #1  | 8,691         | 52,631                               | 0.26        | 14,830                               | 0.11                           | limestone       | Jt                     | 1956-1957, 1960-1962 - Midcontinent Uranium; 1959-1960 - Dalco Uranium, Inc.   |
| 13N.9W.30.141                 | Barbara J #2   | 46,495        | 191,199                              | 0.21        |                                      |                                | limestone       | Jt                     | 1957,1960-1964 - Midecontinent Uranium; 1959 - Dalco Uranium, Inc.   |
|                               | <sup>1</sup> Whitecap  | 11,953        | 41,631                               | 0.17        |                                      |                                |                 |                        | 1959-1960 - Dalco Uranium Co.; 1966-1967 - Farris Mines, Inc.; 1967-1968 - Midcontinent Uranium Co.; 1966-1967-Farris Mines  |
|                               | <b>TOTAL</b>   | <b>58,448</b> | <b>232,830</b>                       | <b>0.20</b> |                                      |                                |                 |                        |  |
| 13N.9W.30.221                 | Barbara J #3   | 102,128       | 485,719                              | 0.23        |                                      |                                | limestone       | Jt                     | 1959-1963 - Midcontinent Uranium Co.   |
| 13N.9W.18.441                 | Beacon Hill-Gossett (Section 18)   | 39,354        | 166,065                              | 0.21        | 22,671                               |                                | sandstone       | Jmp                    | 1956 - Holly Mining Co.; 1957-Lea Exploration Co; 1958-1959-E.P. Moe; 1960-1961-KSN Co., Inc.; 1962-1963,1966-1967-Farris Mines  |
| 15N.17W.28.132                | Becenti (NW1/4 Section 28, Eunice Becenti allotment)                         | 846           | 3,350                                | 0.20        | 2,266                                | 0.14                           | sandstone       | Kd                     | 1952-1954 - Tucker, Hyde, Davenport<br>1953 - Hagens, Fitzhugh, Davenport<br>1956,1958-1959 - A.W. Tucker  |
| 15N.17W.28.344                | Becenti (SW1/4 Section 28, Naomi Becenti allotment) mined through Diamond #2 | 8,536         | 42,499                               | 0.25        | 20,847                               | 0.13                           | sandstone       | Kd                     | 1958-1959 - Largo Uranium Co.<br>1964-1966 - A and 8 Mining Co.<br>1968-1969 - Shiprock Ltd.   |
| 14N.11W.19.220                | <sup>1</sup> Billy the Kid (Section 19)                                      | 872           | 2,693                                | 0.15        | 4,276                                |                                | limestone       | Jt                     | 1952 - Warren McCormick; 1952-W.A. Greer; 1953-Maddox-Teague; 1954-Continental Divide; 1958-H.E. Andrews; 1960-Don W. Wright   |
| 15N.13W.12.322                | <sup>1</sup> Black Jack #1   | 1,439,432     | 6,440,419                            | 0.22        |                                      |                                | sandstone       | Jmw                    | 1959-1961 - Lance Corp.; 1960-1961-Homestake Mining Co; 1961-Sabre-Pinon Corp.; 1962-1968-Homestake-Sapin Partners; 1969-1970-United Nuclear-Homestake Partners  |
| 15N.13W.18.223                | <sup>1</sup> Black Jack #2   | 247,613       | 1,129,004                            | 0.23        | —                                    | —                              | sandstone       | Jmb                    | 1959-1961 - Lance Corp.; 1961-Sabre Pinon Corp.; 1962-1967-Homestake-Sapin Partners; 1968-1970-United Nuclear-Homestake Partners   |
| 13N.10W.24.234                | Blue Peak  | 12,051        | 44,020                               | 0.19        | 18,707                               | —                              | sandstone       | Jmp                    | 1951-1952-Blue Peak Mining; 1953-Shattuck Denn; 1955-Saint Michaels Foundation; 1956-Colohoma Uranium, Inc.; 1957-1958-Three Jacks Mining; 1954-1960-Farris Mining Co.; 1960-1961-Lloyd O. Sutton; 1964-Lee Garcia |
| 13N.10W.24.144                | Bob Cat  | 117           | 186                                  | 0.06        | 71                                   | 0.12                           | sandstone       | Jmp                    | 1956-Brown and Wallace   |

| Number         | Mine Name                               | Tons Ore | Pounds U <sub>3</sub> O <sub>8</sub> | %U308 | Pounds V <sub>2</sub> O <sub>5</sub> | %V <sub>2</sub> O <sub>5</sub> | Type of deposit | Host Rock <sup>4</sup> | Periods of Production/Shipper   |
|----------------|---|----------|--------------------------------------|-------|--------------------------------------|--------------------------------|-----------------|------------------------|---|
| 14N.10W.14.414 | <sup>1</sup> Buckey (Jeep)              | 161,635  | 770,893                              | 0.24  | 241                                  | —                              | sandstone       | Jmw                    | 1957-1958-Holly Minerals; 1958-1965-See Tee Mining Co.  |
| 16N.17W.35.411 | C D and S                               | 16       | 48                                   | 0.15  | —                                    | —                              | sandstone       | Jmw                    | 1957-C D and S Mining Co.   |
| 13N.9W.33.433  | Charlotte (Section 33)                  | 208      | 704                                  | 0.17  | —                                    | —                              | limestone       | Jt                     | 1958-Westvaco Minerals  |
| 16N.16W.17.212 | <sup>1</sup> Church Rock (Section 17)   | 77,965   | 302,608                              | 0.19  | —                                    | —                              | sandstone       | Jmw,Jmb,<br>Kd         | 1960-1961-Phillips Petroleum Co.; 1961-1962-Quinta Corporation (now owned by United Nuclear Corp.)  |
| 14N.9W.35.332  | <sup>1</sup> Cliffside - Section 36     | 7,074    | 6,046,780                            | 0.41  | —                                    | —                              | sandstone       | Jmw                    | 1960-1963-Phillips Petroleum Co.; 1963-1968-United Nuclear; 1970-Kerr McGee   |
| 13N.9W.20.312  | Davenport Incline                       | 7,517    | 28,539                               | 0.19  | —                                    | —                              | sandstone       | Jmp                    | 1957-1958-E.P. Moe; 1959-Black Rock Mining; 1961-See Tee Mining Co.; 1966-Bailey and Fife   |
| 15N.17W.33.214 | Diamond #2 (Largo #2, Mike Smith Lease) | 47,181   | 202,440                              | 0.21  | 65,450                               | —                              | sandstone       | Kd                     | 1952-Albert Smith; 1953-Adee Dodge Enterprises; 1953-1954-General Uranium Co.; 1954-1959-Largo Uranium Co.; 1964-1957- A and B Mining Co.; 1970-Shiprock Ltd. |
| 13N.9W.20.411  | <sup>1</sup> Dog, Flea, and BG Group    | 244,177  | 906,235                              | 0.19  | —                                    | —                              | sandstone       | Jmp                    | 1957-1970-Four Corners Exploration  |
| 13N.9W.21.324  | <sup>1</sup> Doris-Section 21           | 31,950   | 118,052                              | 0.18  | —                                    | —                              | sandstone       | Jmp                    | 1958-1959-Westvaco Minerals; 1959-1961-Phillips Petroleum Co.; 1961-KSN Co.   |
| 14N.10W.11.312 | Dysart #1 (Section 11)                  | 891,922  | 3,795,495                            | 0.21  | 47,438                               | —                              | sandstone       | Jmw                    | 1956-1960-Rio de Oro; 1959-1960-Midcontinent Exploration Co.; 1961-1962-Homestake-Sapin   |
| 14N.10W.11.424 | Dysart #2                               | 237,602  | 894,642                              | 0.18  | —                                    | —                              | sandstone       | Jmw                    | 1959-1961-Rio de Oro; 1959-Midcontinent Exploration Co.; 1961-1962-Homestake-Sapin  |
| 13N.9W.20.233  | East Malpais Lease                      | 30,333   | 139,818                              | 0.23  | —                                    | —                              | sandstone       | Jmp                    | 1959-1960-Four Corners Exploration Co.  |
| 14N.12W.24.243 | Elkins Group                            | 59       | 151                                  | 0.13  | 231                                  | 0.20                           | limestone       | Jt                     | 1953-1954-Josephine Elkins  |
| 14N.11W.9.214  | <sup>1</sup> Evelyn                     | 10,743   | 49,584                               | 0.23  | 23,539                               | 0.48                           | sandstone       | Jmb                    | 1953-1956 - Anaconda Co.; 1966-1968-Farris Mines, Inc.; 1969-1970-Smith Development; 1970-Minerals Energy   |
| 13N.9W.29.141  | Faith-Section 29                        | 66,327   | 258,615                              | 0.19  | —                                    | —                              | limestone       | Jt                     | 1958-1959 - Westvaco Minerals; 1960-Phillips Petroleum Co.; 1960-1964-KSN Co.; 1963-United Nuclear  |
| 13N.9W.30.442  | Flat Top                                | 49,663   | 216,486                              | 0.22  | 66,126                               | 0.11                           | limestone       | Jt                     | 1955-1957 - Holly Uranium Co.; 1957-1959-Flat Top Mining Co.; 1963-1966-Bailey and Fife   |
| 15N.16W.4.111  | Foutz #1                                | 324      | 1,844                                | 0.28  | 2,676                                | 0.41                           | sandstone       | Jmw                    | 1953-1954-Foutz Mining Co.; 1953-Hanosh Mines, Inc.   |
| 15N.16W.31.444 | Foutz #2                                | 242      | 1,045                                | 0.22  | 2,877                                | 0.59                           | sandstone       | Jmw                    | 1953-1954 - Foutz Mining Co.  |
| 16N.16W.31.444 | Foutz #3 (Yellow Jacket)                | 2,412    | 8,556                                | 0.18  | 12,466                               | 0.26                           | sandstone       | Jmb                    | 1953-1955 - Foutz Mining Co.  |
| 14N.11W.8.213  | Francis                                 | 755      | 6,164                                | 0.41  | 12,578                               | 0.93                           | sandstone       | Jmb                    | 1953-1954 - Farris Mines, Inc.  |
| 13N.11W.13.312 | <sup>1</sup> Haystack SW1/4 sec. 13     | 1,162    | 2,830                                | 0.12  | —                                    | —                              | limestone       | Jt                     | Haystack Mountain Development Corp.<br>1958,1961-Haystack Development Corp.   |
| 13N.11W.13.444 | Sec. 13                                 | 3,736    | 16,701                               | 0.22  | —                                    | —                              | limestone       | Jt                     | 1956,1958-1961-Art Bibo (mined in trespass)   |
| 13N.10W.19.110 | Sec. 19 (Haystack No. 1)                | 137,310  | 562,267                              | 0.20  | 165,454                              | —                              | limestone       | Jt                     | 1951-A.T.S.F.RR; 1952-1957,1959-1961, 1963-1965-Haystack Mountain Development Corp.   |
| 13N.9W.14.414  | TOTAL Hogan Mine (Section 14)           | 142,208  | 581,798                              | 0.20  | 165,494                              | —                              | sandstone       | Jmp                    | 1959-1961 - Four Corners Exploration Co.; 1962-Homestake-Sapin  |

| Number         | Mine Name   | Tons Ore  | Pounds U <sub>3</sub> O <sub>8</sub> | %U308 | Pounds V <sub>2</sub> O <sub>5</sub> | %V <sub>2</sub> O <sub>5</sub> | Type of deposit               | Host Rock <sup>4</sup> | Periods of Production/Shipper  |
|----------------|---|-----------|--------------------------------------|-------|--------------------------------------|--------------------------------|-------------------------------|------------------------|--|
| 15N.18W.12.244 | Hogback #3-5  | 6,354     | 24,234                               | 0.19  | 2,954                                | 0.03                           | carbonaceous shale            | Kd                     | 1952-1954 - Tucker, Hyde, Davenport; 1955-1956-Hyde Uranium Co.; 1957-1958-Calumet and Hecla; 1958-Mathis and Mathis; 1959-See Tee Mining Co.; 1960-Windsor Mining Co. |
| 13N.9W.7.221   | <sup>1</sup> Iabella (Section 7)                          | 76,748    | 237,060                              | 0.15  | —                                    | —                              | sandstone                     | Jmp                    | 1959-1961-Phillips Petroleum Co.; 1961-1962-KSN Mining Co.   |
| 14N.11W.35.120 | Lost Mine   | 10        | 4                                    | 0.02  | 4                                    | 0.02                           | sandstone                     | Jmb                    | 1954-Berryhill and Elkins  |
| 15N.14W.12.423 | <sup>1</sup> Mac #1                                       | 60,109    | 289,125                              | 0.24  | —                                    | —                              | sandstone                     | Jmb                    | 1968-Homestake-Sapin; 1968-1970-United Nuclear-Homestake   |
| 15N.13W.18.442 | Mac #2  | 31,194    | 109,009                              | 0.14  | —                                    | —                              | sandstone                     | Jmb                    | 1968-Homestake-Sapin; 1968-1970-United Nuclear-Homestake   |
| 13N.9W.20.144  | Malpais Raise   | 42,070    | 198,492                              | 0.24  | —                                    | —                              | sandstone                     | Jmp                    | 1958-Holly Minerals; 1958-1961-See Tee Mining Group  |
| 13N.9W.23.233  | Marquez Mine  | 712,911   | 3,724,047                            | 0.26  | —                                    | —                              | sandstone                     | Jmp                    | 1958-1964-Calumet and Hecla; 1965-1966-United Nuclear Corp.  |
| 14N.10W.11.112 | Mary #1 (Dysart #3)                                       | 357,262   | 794,063                              | 0.11  | —                                    | —                              | sandstone                     | Jmw                    | 1959-1962-Boyles Brothers; 1962-Entrada Corp.; 1964-Stella Dysart; 1964-1965-Homestake-Sapin   |
| 13N.9W.20.321  | Mesa Top Mine   | 108,261   | 512,965                              | 0.24  | 144,610                              | —                              | sandstone                     | Jmp                    | 1954-1957-Lea Exploration Co.; 1957-1958-Holly Minerals  |
| 13N.10W.4.244  | Pat - Junior - Section 4 (Dakota Mine)                    | 5,069     | 12,645                               | 0.12  | 2,478                                | —                              | sandstone                     | Jmw,Kd                 | 1952-1959-Dakota Mining Co.; 1962-1963-Farris Mines, Inc.  |
| 13N.9W.19.420  | <sup>1</sup> Poison Canyon                                | 217,066   | 1,004,574                            | 0.23  | 338,094                              | —                              | sandstone                     | Jmp                    | 1952-1959-Haystack Mountain Development Corp.; 1960-1962-Farris Mines Inc.   |
| 14N.11W.28.113 | Red Cap Group (T Group)                                   | 195       | 497                                  | 0.13  | 951                                  | 0.24                           | limestone                     | Jt                     | 1952-1953-Navajo Development Co.; 1953-Fitzhugh & Doerrie  |
| 13N.10W.16.134 | Red Point Lode  | 482       | 1,223                                | 0.13  | 746                                  | 0.07                           | limestone                     | Jt                     | 1952-1955-R.M. Shaw  |
| 14N.11W.20.144 | Red Top Mines   | 165       | 390                                  | 0.12  | 1,287                                | 0.39                           | limestone                     | Jt                     | 1955-Red Top Uranium Mining Co.  |
| 14N.9W.34.424  | <sup>1</sup> Sandstone                                    | 1,034,255 | 3,540,829                            | 0.17  | —                                    | —                              | sandstone                     | Jmw                    | 1959-1963-Phillips Petroleum Co.; 1963-1970-United Nuclear Corp.   |
| 13N.9W.1.200   | <sup>1</sup> Section 1 (13N-9W) mined through Cliffside   | 148,066   | 1,699,137                            | 0.57  | —                                    | —                              | sandstone                     | Jmw                    | 1967,1969-1970-Kerr McGee; 1969-1970-National Lead Co.   |
| 15N.16W.3.332  | Section 3 (15N-16W) Santa Fe-Christensen (Rats Nest Mine) | 324       | 1,836                                | 0.28  | 404                                  | —                              | carbonaceous sandstone (coal) | Kd                     | 1957-George Christensen; 1957-1958-Rem Uranium Co.   |
| 13N.10W.5.144  | Section 5 (13N-10W)                                       | 23        | 54                                   | 0.12  | —                                    | —                              | sandstone                     | Kd                     | 1958-Westvaco  |
| 13N.9W.8.114   | Section 8 (13N-9W) (Spencer Shaft)                        | 47,808    | 165,319                              | 0.17  | —                                    | —                              | sandstone                     | Jmp                    | 1958-1960-United Western; 1961-Hyde and Casper; 1964-1966-W.D. Tripp; 1966-1967-James J. Goode   |
| 14N.10W.10.244 | <sup>1</sup> Section 10 (14N-10W)                         | 130,767   | 510,935                              | 0.20  | —                                    | —                              | sandstone                     | Jmw                    | 1957-1962-Kermac Nuclear; 1964-Homestake-Sapin   |
| 14N.10W.12.411 | <sup>1</sup> Section 12 (14N-10)                          | 74,975    | 211,873                              | 0.14  | —                                    | —                              | sandstone                     | Jmw                    | 1961-Anderson Development Corp.; 1962-1963-Stella Dysart   |
| 13N.9W.13.334  | Section 13 (13N-9W) SW1/4 (mined through Rialto shaft)    | 1,689     | 6,312                                | 0.19  | —                                    | —                              | sandstone                     | Jmp                    | 1962-1963-Febco Mines, Inc.  |
| 14N.10W.15.441 | <sup>1</sup> Section 15 (14N-10W)                         | 1,213,814 | 3,625,924                            | 0.15  | —                                    | —                              | sandstone                     | Jmw                    | 1958-1968-Homestake-Sapin; 1961-1965-Rio de Oro; 1968-1970-United Nuclear-Homestake  |
| 14N.9W.17.323  | <sup>1</sup> Section 17 (14N-9W)                          | 544,164   | 2,315,182                            | 0.21  | —                                    | —                              | sandstone                     | Jmw                    | 1960-1964-Kermac Nuclear; 1965-1970-Kerr McGee   |

| Number         | Mine Name   | Tons Ore  | Pounds U <sub>3</sub> O <sub>8</sub> | %U308 | Pounds V <sub>2</sub> O <sub>5</sub> | %V <sub>2</sub> O <sub>5</sub> | Type of deposit | Host Rock <sup>4</sup> | Periods of Production/Shipper   |
|----------------|---|-----------|--------------------------------------|-------|--------------------------------------|--------------------------------|-----------------|------------------------|---|
| 13N.10W.18.341 | Section 18 (13N-10W)<br>(Indian Allotment)                                      | 25,796    | 98,175                               | 0.19  | 75,342                               | 0.30                           | limestone       | Jt                     | 1952-F.A. Sifton; 1952-Thompson and Williams;<br>1952-1953-Glen Williams; 1955-1956-Santa Fe<br>Uranium Co.; 1956-1959-Federal Uranium Corp.;<br>1963-1964-Mesa Mining Co.; 1966-Cibola Mining Co.  |
| 14N.9W.18.400  | <sup>1</sup> Section 18 (14N-9W)<br>mined through Sec. 17                       | 501,946   | 1,586,447                            | 0.16  |                                      |                                | sandstone       | Jmw                    | 1962-1964-Kermac Nuclear; 1965-1970-Kerr McGee  |
| 14N.9W.20.114  | <sup>1</sup> Section 20 (14N-9W)<br>mined through Sec. 17                       | 486,375   | 2,223,977                            | 0.23  |                                      |                                | sandstone       | Jmw                    | 1962-Kermac Nuclear   |
| 14N.10W.22.223 | <sup>1</sup> Section 22<br>(14N-10W) heap leach                                 | 2,189,051 | 11,605,672                           | 0.18  |                                      |                                | sandstone       | Jmw                    | 1958-1964-Kermac Nuclear; 1965-1970-Kerr McGee  |
| 14N.10W.23.134 | <sup>1</sup> Section 23<br>(14N-10W)  | —         | 38,105                               | —     |                                      |                                | sandstone       | Jmw                    | 1959-1968-Homestake-Sapin; 1969-1970-Homestake-<br>United Nuclear   |
| 13N.10W.23.444 | Section 23 (13N-10W)  | 21,826    | 138,541                              | 0.32  | 10,256                               | 0.06                           | limestone       | Jt                     | 1957-1965-Haystack Mountain Development Corp.;<br>1965-1966-Santa Fe Pacific  |
| 13N.9W.24.121  | Section 24 (13N-9W)<br>Chill Wills, Rialto                                      | 9,261     | 31,381                               | 0.17  | —                                    | —                              | sandstone       | Jmp                    | 1960-1963-Febeo Mines, Inc.   |
| 13N.9W.24.300  | Section 24 (13N-9W)<br>(SI/2, East Marquez)<br>mined through<br>Marquez decline | 10,120    | 33,800                               | 0.17  |                                      |                                | sandstone       | Jmp                    | 1960-1962-Calumet and Hecla   |
| 13N.11W.24.222 | Section 24 (13N-11W)<br>(Nana-A-Bah Vandever Allotment)                         | 24,638    | 115,075                              | 0.22  | 85,545                               | 0.18                           | limestone       | Jt                     | 1952-1954-Glen Williams; 1955-1956-Santa Fe<br>Uranium Co.; 1956-1957-Federal Uranium Corp.   |
| 14N.10W.24.332 | <sup>1</sup> Section 24<br>(14N-10W)<br>Heap leach                              | 1,904,582 | 7,071,564                            | 0.19  |                                      |                                | sandstone       | Jmw                    | 1959-1964-Kerr-McGee Nuclear; 1965-1970-Kerr<br>McGee   |
| 13N.10W.25.411 | <sup>1</sup> Section 25 (13N-10W)   | 235,156   | 579                                  | —     | 153,657                              | 0.12                           | limestone       | Jt                     | 1951-AT and SFRR; 1955-1961-Haystack Mountain<br>Development Corp.; 1962-1965-Santa Fe Pacific;<br>1963, 1965-1966-Farris Mines, Inc.; 1968-Homestake<br>Mining Co.; 1969-1970-United Nuclear Corp. |
| 14N.10W.25.144 | <sup>1</sup> Section 25<br>(14N-10W)  | 1,791,048 | 6,444,889                            | 0.18  | —                                    | —                              | sandstone       | Jmw                    | 1959-1969-Homestake-Sapin; 1969-1970-Homestake-<br>United Nuclear   |
| 13N.10W.26.221 | <sup>1</sup> Section 26 (13N-10W)<br>(Desidero Allotment)                       | 11,110    | 83,752                               | 0.38  | 17,518                               | 0.08                           | limestone       | Jt                     | 1952-1957-Hanosh Hines  |
| 14N.10W.26.220 | <sup>1</sup> Section 26 (14N-10W)<br>mined through<br>Section 24                | 362,110   | 1,198,696                            | 0.17  | —                                    | —                              | sandstone       | Jmw                    | 1965-1970-Kerr-McGee  |
| 14N.9W.27.324  | <sup>1</sup> Section 27 (14N-9W)<br>mined through                               | 553,732   | 2,442,855                            | 0.22  |                                      |                                | sandstone       | Jmw                    | 1967-1970-United Nuclear  |
| 14N.9W.27.310  | Ann Lee   | 285,057   | 1,275,695                            | 0.22  |                                      |                                |                 | Jmw                    |   |
|                | section total   | 838,789   | 3,718,550                            | 0.22  |                                      |                                |                 |                        |   |
| 14N.9W.28.333  | Section 28 mined<br>through Sec. 30   | 23,648    | 94,333                               | 0.20  |                                      |                                | sandstone       | Jmw                    | 1958-United Western   |
| 14N.9W.29.300  | Section 29 (14N-9W)<br>mined through<br>Sec. 32 shaft                           | 390,511   | 1,999,236                            | 0.26  |                                      |                                | sandstone       | Jmw                    | 1961-1964-Kermac Nuclear; 1965-1970-Kerr McGee  |

| Number         | Mine Name  | Tons Ore  | Pounds U <sub>3</sub> O <sub>8</sub> | %U308 | Pounds V <sub>2</sub> O <sub>5</sub> | %V <sub>2</sub> O <sub>5</sub> | Type of deposit        | Host Rock <sup>4</sup> | Periods of Production/Shipper  |
|----------------|--|-----------|--------------------------------------|-------|--------------------------------------|--------------------------------|------------------------|------------------------|--|
| 14N.9W.29.100  | Section 29<br>mined through<br>Sec. 30 shaft   | 318,361   | 1,401,003                            | 0.22  |                                      |                                | sandstone              | Jmw                    | 1960-1970-Kerr-McGee   |
| 14N.9W.29.400  | Section 29<br>mined through<br>Sec. 33   | 641,918   | 1,936,819                            | 0.15  |                                      |                                | sandstone              | Jmw                    | 1963-Kerr-McGee  |
| 13N.9W.30.333  | Section 30 (13N-9W)<br>Roundy Lease,<br>Rimrock #3   | 91,513    | 464,810                              | 0.25  | 76,565                               |                                | limestone              | Jt                     | 1952-1956-F.O. Manot; 1956-1966-Rimrock Mining Co.; 1970-Bailey and Fife   |
| 14N.9W.30.232  | <sup>1</sup> Section 30 (14N-9W)   | 2,855,164 | 15,064,056                           | 0.26  | —                                    |                                | sandstone              | Jmw                    | 1959-1964-Kermac Nuclear; 1965-1970-Kerr McGee   |
| 14N.9W.30.141  | <sup>1,3</sup> Section 30W (14N-9W)  | 68,895    | 282,714                              | 0.21  |                                      |                                | sandstone              | Jmw                    | 1970-Kerr-McGee  |
| 14N.9W.31.200  | Section 31 (14N-9W)<br>mined through Sec. 32   | 3,469     | 17,999                               | 0.26  | —                                    |                                | sandstone              | Jmw                    | 1970-Kerr-McGee  |
| 13N.9W.31.120  | Section 31 (13N-9W)  | 15,736    | 77,121                               | 0.25  | 21,628                               | 0.27                           | limestone              | Jt                     | 1953-1954, 1958, 1961-Haystack Mountain Development Corp.; 1962-Santa Fe Pacific   |
| 13N.9W.32.144  | Section 32 (13N-9W)<br>Moe #4  | 2,407     | 9,746                                | 0.25  | 21,628                               | 0.27                           | limestone              | Jt                     | 1963-Sutton and Moe  |
| 14N.9W.32.122  | Section 32 (14N-9W)  | 488,031   | 1,927,388                            | 0.20  | —                                    | —                              | sandstone              | Jmw                    | 1958-1961-Homestake-New Mexico; 1961-1968-Homestake-Sapin; 1968-1970-United Nuclear-Homestake  |
| 13N.9W.32.144  | Section 32 (15N-11W)<br>(NE1/4, D. Begay allotment) mined<br>through Moe #5 decline  | 20,117    | 89,091                               | 0.22  |                                      |                                | sandstone              | Jmb                    | 1960-1963-Kermac Nuclear; 1964-1968-E.P. Moe; 1968-1969-DeVilliers Nuclear   |
| 15N.11W.33.242 | Section 33 (15N-11W)<br>Moe #5, West Ranch Mine  | 4,243     | 21,149                               | 0.25  |                                      |                                | sandstone              | Jmb                    | 1960,1962-1963-Kermac Nuclear<br>1964-E.P. Moe   |
| 14N.9W.33.213  | <sup>1</sup> Section 33 (14N-9W)<br>Branson heap leach   | 960,007   | 3,222,939                            | 0.16  |                                      |                                | sandstone              | Jmw                    | 1959-1961-Ambrosia Lake Uranium Co.; 1959-1963-Phillips Petroleum Co.; 1962-1964-Kermac Nuclear; 1964-1965-United Nuclear Corp.; 1965-1970; Kerr McGee     |
|                | NOTE: Ambrosia Lake Uranium Co. consisted of Kerr-McGee, Anderson Development Co., Pacific Uranium Co., Phillips Petroleum Co., and Branson Estate |           |                                      |       |                                      |                                |                        |                        |  |
| 13N.10W.36.224 | Section 36 (13N-10W)<br>Rimrock  | 1,435     | 3,770                                | 0.13  | 2,698                                | 0.19                           | limestone              | Jt                     | 1952-1953-Moses Mirabel; 1954-1955-Skult-Munson;<br>1958-Chena Mining Co.; 1962-Homer Scriven  |
| 14N.10W.36.222 | Section 36 (14N-10W)<br>Lease 60-167   | 5,249     | 53,349                               | 0.51  | 45,950                               | 0.43                           | sandstone              | Jmb                    | 1957-1958-V.C.A.; 1959-United Western  |
| 14N.12W.10.243 | Silver Bit 1-18  | 293       | 3181                                 | 0.54  | 3,340                                | 0.57                           | sandstone              | Jmw,Jmb                | 1955-1956-G.W. Fields; 1957-Monitor Exploration;<br>1957-United Western Mining   |
| 14N.10W.31.334 | Silver Spur Group  | 5,938     | 29,454                               | 0.25  | 19,202                               | 0.25                           | sandstone              | Kd                     | 1952-Chas Davis; 1952-1953-Silver Spur Mining Co.; 1955-Holly Uranium Co.; 1956-Holly Minerals; 1957-1959-F-beo Mines; 1958-Holly Corp.; 1956-Farris Mines |
| 15N.16W.4.414  | U Mine<br>Christensen 1-20   | 2,560     | 8,460                                | 0.17  | 4,075                                | 0.09                           | carbonaceous sandstone | Kd                     | 1953-1954-Williams and Reynolds; 1955-Frontier Uranium; 1957-George Christensen; 1957-Rem Uranium Co.; 1958-W.C.T. Engineering Co                          |

| Number        | Mine Name                        | Tons Ore | Pounds U <sub>3</sub> O <sub>8</sub> | %U <sub>3</sub> O <sub>8</sub> | Pounds V <sub>2</sub> O <sub>5</sub> | %V <sub>2</sub> O <sub>5</sub> | Type of deposit | Host Rock <sup>4</sup> | Periods of Production/Shipper  |
|---------------|----------------------------------|----------|--------------------------------------|--------------------------------|--------------------------------------|--------------------------------|-----------------|------------------------|--|
| 13N.9W.34.343 | Vallejo Mine                     | 6,458    | 21,733                               | 0.17                           | 394                                  | --                             | limestone       | Jt                     | 1957-1959-Vallejo Uranium Mines; 1959-1960-Samson Oil and Minerals; 1962-1963-Penta Mining Co. |
| 15N.16W.2.442 | Westwater #1                     | 4,713    | 26,571                               | 0.28                           | 27,134                               | 0.40                           | sandstone       | Jmw                    | 1957-1960-Westwater Uranium Corp.  |
|               | <sup>5</sup> Mine Water Recovery | --       | 893,787                              | --                             | --                                   | --                             |                 | Jmw                    | 1963-1970-Kerr McGee, Homestake-Sapin Partners, United Nuclear                                 |

NOTE: In November 1961, Homestake-Sapin Partners acquired Homestake-New Mexico Partners. In April 1962, United Nuclear Corp. merged with the Sabre-Pinon Corp. and United Nuclear became the surviving corporation and became United Nuclear Corp. In February 1963, United Nuclear Corp. acquired the uranium mines and mill of the Phillips Petroleum Co. In 1965, Kermac Nuclear Fuels Corp. was dissolved. The operating company became Kerr-MoGee Oil Industries, Inc. Later it was the Kerr-McGee Corp. and the Kerr-McGee Nuclear Corp. In April 1968, Homestake-Sapin Partners became United Nuclear-Homestake Partners. See Chenoweth (1989) for a listing of Ambrosia Lake operations.

Table 2—Uranium mines in New Mexico that have produced from 1971 to 1991.

| Occurrence number                                 | Mine name                             | Production <sup>1</sup> class | Host <sup>2</sup> rock | Periods of production/Shipper                                  |
|---|---------------------------------------|-------------------------------|------------------------|--|
| <b>GRANTS URANIUM DISTRICT</b>                    |                                       |                               |                        |  |
| <u>Cibola County (formerly Valencia County)</u>   |                                       |                               |                        |  |
| 12N.9W.33.444                                     | <sup>3</sup> P-33 (Section 33)        | c                             | Jt                     | 1971-1977 - Homestake  |
| 11N.5W.26,33                                      | <sup>3</sup> Jackpile-Paguate         | e                             | Jmj                    | 1971-1982 - Anaconda   |
| 11N.5W.13.300                                     | JJ #1                                 | d                             | Jmj                    | 1976-1981 - Sohio-Reserve                                      |
| 13N.8W.24.433                                     | Mt. Taylor                            | d                             | Jmw                    | 1980-1983 - Gulf, 1985-1990 - Chevron                          |
| 12N.9W.4  | <sup>3</sup> Red Bluff-Gay Eagle      | b                             | Jt                     | 1976 - Moises-Mirabel  |
| 11N.4W.19.300,<br>11N.4W.30.240,<br>11N.5W.24.411 | <sup>3</sup> St. Anthony              | b                             | Jmj                    | 1976-1980 - United Nuclear                                     |
| 13N.8W.30.243                                     | <sup>3</sup> San Mateo Mine           | d                             | Jmp                    | 1971 - United Nuclear  |
| <u>McKinley County</u>                            |                                       |                               |                        |  |
| 14N.9W.28.144                                     | <sup>3</sup> Ann Lee (Spider Rock)    | d                             | Jmw                    | 1971-1972, 1982 - United Nuclear;<br>1977-1982 - Spider Rock   |
| 13N.9W.30.221                                     | <sup>3</sup> Barbara J #3 (White Cap) | c                             | Jt                     | 1979-1980 - Todilto Exp. Dev. Co.                              |
| 14N.11W.19.220                                    | <sup>3</sup> Billy the Kid            | a                             | Jt                     | 1976 - Henry Andrews   |
| 15N.13W.12.322                                    | <sup>3</sup> Black Jack #1            | d                             | Jmw                    | 1971 - United Nuclear-Homestake                                |
| 14N.10W.14.414                                    | <sup>3</sup> Buckey                   | c                             | Jmw                    | 1972 - Hydro-Nuclear; 1978-1980, 1982 - Cobb                   |
| 16N.16W.17.212                                    | <sup>3</sup> Church Rock (Sec. 8, 17) | c                             | Jmw, Jmb, Kd           | 1976-1977, 1979-1982 - United Nuclear                          |
| 14N.9W.36.332                                     | <sup>3</sup> Cliffside-Section 36     | d                             | Jmw                    | 1971-1985 - Kerr McGee   |
| 13N.9W.20.411                                     | <sup>3</sup> Dog, Flea, and BG Group  | c                             | Jmp                    | 1971-1975 - Four Corners Exp.;<br>1978-1980 - M&M Mining       |
| 13N.9W.21.324                                     | <sup>3</sup> Doris-Section 21         | b                             | Jmp                    | 1978-1979 - Ranchers   |
| 14N.11W.9.214                                     | <sup>3</sup> Evelyn                   | b                             | Jmb                    | 1971 - Smith Dev.; 1971-1972 - Stevenson;<br>1972 - Oral Creek |
| 13N.11W.13.314                                    | <sup>3</sup> Haystack-Section 13      | c                             | Jt                     | 1975-1981 - Todilto Exp. and Dev.                              |
| 13N.10W.19.110                                    | Section 18 and 19                     | c                             |                        |  |
| 13N.9W.19.323                                     | Hope (Section 19)                     | b                             | Jt                     | 1977-1981 - Ranchers   |
| 13N.9W.7.221                                      | <sup>3</sup> Isabella                 | c                             | Jmp                    | 1978-1980 - Koppin; 1980-United Nuclear                        |
| 13N.8W.7,18                                       | Johnny M (Sections 7, 18)             | d                             | Jmw                    | 1976-1982 - Ranchers   |

| Occurrence number | Mine name  | Production <sup>1</sup> class | Host <sup>2</sup> rock | Periods of production/Shipper                                  |
|-------------------|--|-------------------------------|------------------------|--|
| 15N.14W.12.423    | <sup>3</sup> Mac #1  | c                             | Jmb                    | 1976–1978, 1980 - United Nuclear-Homestake                     |
| 15N.14W.12.134    | Mariano Lake (Section 12)                                      | d                             | Jmb                    | 1977–1982 - Gulf   |
| 17N.16W.35.200    | N.E. Church Rock (2 shafts)                                    | d                             | Jmw                    | 1972–1982 - United Nuclear                                     |
| 17N.16W.35.200    | N.E. Church Rock #1  | d                             | Jmw                    | 1976–1985 - Kerr McGee   |
| 17N.16W.36.100    | N.E. Church Rock #1-E  | d                             | Jmw                    | 1979–1985 - Kerr McGee   |
| 17N.16W.27.200    | N.E. Church Rock #2  | d                             | Jmw                    | 1978–1982 - Kerr McGee   |
| 13N.9W.30.143     | Piedra Trieste (Section 30)                                    | a                             | Jt                     | 1979–1981 - Todilto Exp. & Dev.                                |
| 13N.9W.19.420     | <sup>3</sup> Poiston Canyon                                    | c                             | Jmp                    | 1976–1978 - Reserve  |
| 15N.13W.21.142    | Ruby #1 } mined through  | d                             | Jmb                    | 1976–1979 - Western Nuclear                                    |
| 15N.13W.25.224    | Ruby #3 and #4 } same decline                                  |                               |                        | 1980–1982 - Western Nuclear                                    |
| 15N.13W.25.224    | Ruby #3 and #4   | d                             | Jmb                    | 1980–1982, 1984–1985 - Western Nuclear                         |
| 14N.9W.34.424     | <sup>3</sup> Sandstone   | d                             | Jmw                    | 1974–1980 - United Nuclear                                     |
| 13N.9W.1.200      | <sup>3,4</sup> Section 1 (13N-9W)<br>mined through Cliffside   | d                             | Jmw                    | 1971–1982 - Kerr McGee   |
| 14N.10W.10.244    | <sup>3</sup> Section 10 (14N-10W)                              | c                             | Jmw                    | 1980 - Cobb  |
| 14N.10W.12.411    | <sup>3</sup> Section 12 (14N-10W)                              | c                             | Jmw                    | 1978–1982 - Cobb; 1980 - United Nuclear                        |
| 14N.10W.13.413    | Section 13 (14N-10W)   | c                             | Jmw                    | 1977–1981 - United Nuclear-Homestake;<br>1981 - Homestake      |
| 14N.10W.15.441    | <sup>3</sup> Section 15 (14N-10W)                              | d                             | Jmw                    | 1971–1981 - United Nuclear-Homestake;<br>1981 - Homestake      |
| 13N.9W.16.441     | Section 16 (13N-9W)<br>mined through Dog-Flea mines            | b                             | Jmp                    | 1973 - United Nuclear-Homestake                                |
| 14N.9W.17.323     | <sup>3</sup> Section 17 (14N-9W)                               | d                             | Jmw                    | 1971–1985 - Kerr McGee   |
| 14N.9W.18.420     | <sup>3,4</sup> Section 18 (14N-9W)<br>mined through Section 17 | d                             | Jmw                    | 1971–1982 - Kerr McGee   |
| 14N.9W.19.411     | Section 19 (14N-9W)  | d                             | Jmw                    | 1978–1985 - Kerr McGee   |
| 14N.9W.20.114     | <sup>3,4</sup> Section 20 (14N-9W)<br>mined through Section 17 | d                             | Jmw                    | 1971–1979 - Kerr McGee   |
| 14N.10W.22.223    | <sup>3</sup> Section 22 (14N-10W)                              | d                             | Jmw                    | 1971–1985 - Kerr McGee   |
| 14N.10W.23.134    | <sup>3</sup> Section 23 (14N-10W)                              | d                             | Jmw                    | 1971–1982 - United Nuclear-Homestake;<br>1981–1989 - Homestake |
| 16N.17W.23.221    | Section 23 (16N-17W)   | a                             | Jmw                    | 1975 - Grace Nuclear (in situ production)                      |
| 14N.10W.24.332    | <sup>3</sup> Section 24 (14N-10W)                              | d                             | Jmw                    | 1971–1985 - Kerr McGee   |

| Occurrence number                  | Mine name  | Production <sup>1</sup> class | Host <sup>2</sup> rock | Periods of production/Shipper   |
|------------------------------------|--|-------------------------------|------------------------|---|
| 13N.10W.25.411                     | <sup>3</sup> Section 25 (13N-10W)                                      | c                             | Jt                     | 1971, 1979 - United Nuclear;<br>1972-1973 - United Nuclear-Homestake;<br>1972-1973 - Bailey and Fife; 1980-1981 - Reserve |
| 13N.9W.8.114                       | Section 8 (Spencer Shaft)  | c                             | Jmp                    | 1978-1979 - Koppin  |
| 14N.10W.25.144                     | <sup>2</sup> Section 25 (14N-10W)                                      | d                             | Jmw                    | 1971-1981 - United Nuclear-Homestake;<br>1981-1985 - Homestake  |
| 14N.9W.26                          | Section 26 (14N-9W)<br>mined through Section 35<br>and sandstone       | c                             | Jmw                    | 1971-1972, 1977-1982 - Kerr McGee   |
| 14N.9W.26.430                      | <sup>4</sup> Section 26 (14N-10W)                                      | c                             | Jmw                    | 1971-1982 - Kerr McGee  |
| 14N.9W.27.310,324                  | <sup>4</sup> Section 27 E and W  | d                             | Jmw                    | 1971-1979 - United Nuclear  |
| 14N.9W.29                          | <sup>3,4</sup> Section 29 (14N-9W)<br>mined through Sections 32 and 30 | d                             | Jmw                    | 1971-1982 - Kerr McGee  |
| 14N.9W.30.232                      | <sup>3</sup> Section 30 (14N-9W)                                       | d,e                           | Jmw                    | 1971-1985 - Kerr McGee  |
| 14N.9W.30.141                      | <sup>3</sup> Section 30W (14N-9W)                                      | d,e                           | Jmw                    | 1971-1985 - Kerr McGee  |
| 13N.9W.30.333                      | <sup>3</sup> Section 30 (13N-9W)                                       | c                             | Jt                     | 1971 - Bailey and Fife  |
| 14N.9W.31.200                      | <sup>1,3</sup> Section 31 (14N-9W)                                     | c                             | Jmw                    | 1971-1972, 1980-1981 - Kerr McGee   |
| 14N.9W.32.122                      | <sup>3</sup> Section 32 (14N-9W)                                       | d                             | Jmw                    | 1971-1981 - United Nuclear-Homestake;<br>1981-1982 - Homestake  |
| 14N.11W.32.224                     | <sup>3</sup> Section 32-33 (West Ranch)                                | c                             | Jmw                    | 1972 - Hydro Nuclear; 1978 - Cobb   |
| 14N.9W.33.213                      | <sup>3</sup> Section 33 (14N-9W)                                       | d                             | Jmw                    | 1971-1985 - Kerr McGee  |
| 14N.9W.35.233                      | Section 35 (14N-9W)<br>(Elizabeth Shaft)                               | d                             | Jmw                    | 1971-1985 - Kerr McGee  |
| <u>Sandoval County</u>             |  |                               |                        |   |
| 12N.3W.18.141                      | Rio Puerco   | a                             | Jmw                    | 1979-1980 - Kerr McGee  |
| <u>Insitu Leaching Pilot Plant</u> |  |                               |                        |   |
| 17N.13W.9.322,<br>17N.13W.16       | Crownpoint   | a                             | Jmw                    | 1981-1987 - Mobil (Nufuels)   |

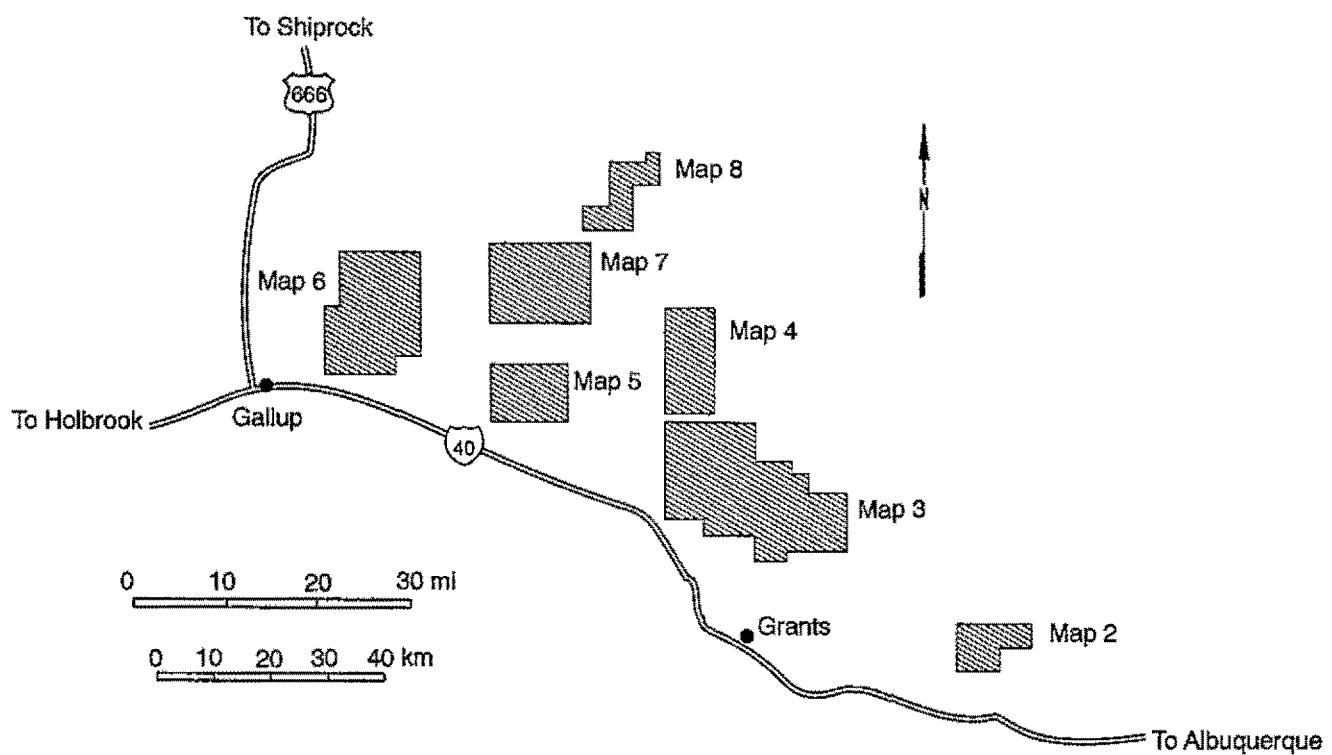
<sup>1</sup>Production Class: a - 0–20,000 lbs U<sub>3</sub>O<sub>8</sub>; b - 20,000–100,000 lbs U<sub>3</sub>O<sub>8</sub>; c - 200,000–2 million lbs U<sub>3</sub>O<sub>8</sub>; d - 2 million–20 million lbs U<sub>3</sub>O<sub>8</sub>; e - greater than 20 million lbs U<sub>3</sub>O<sub>8</sub> (total production to date).

<sup>2</sup>Host rock: Jt - Todilto Limestone; Jmr - Recapture Member; Jmw - Westwater Canyon Member; Jmb - Brushy Basin Member; Jmp - Poison Canyon Sandstone; Jmj - Jackpile Sandstone; Jmj - Jackpile Sandstone; Kd - Dakota Formation.

<sup>3</sup>Produced prior to 1970, included Table 1. Production classification based on total production.

<sup>4</sup>Properties mined through adjacent shafts.

NOTE: In 1981, the United Nuclear-Homestake Partnership was dissolved. Homestake Mining Co. became the sole operator of the mill and the Sections 13, 15, 23, 25, and 32 mines. (All but Section 23 closed in 1981–1982, but Homestake continued to recover uranium from mine water until June 1990.) In 1983, Kerr McGee reorganized the uranium operations in New Mexico into the Quivira Mining Co. Quivira closed its mines in March 1985 but continued to recover uranium from mine water. In 1988, Kerr McGee sold the Quivira Mining Co. to Rio Algom Ltd. Rio Algom Mining Corp. (U.S. subsidiary) continues to recover uranium from mine water.



MAP 1 - LOCATION OF URANIUM ORE DEPOSIT MAPS OF THE GRANTS URANIUM DISTRICT, NEW MEXICO.

Brushy Basin-Poison Canyon Ore. NOTE: McCommon et al. (1986) consider the Poison Canyon sandstone (of economic usage) to be part of the Westwater Canyon Member, not the Brushy Basin Member.

| Property                                      | Location           | Estimated depth (ft) | Host  | Dominant type of deposit | Estimated size  | References   |
|---|--------------------|----------------------|-------|--------------------------|---|--|
| *Bobcat-Blue Peak                             | 24 T13N R10W       | surface              | Jmb   | primary                  | 44,206 lbs U <sub>3</sub> O <sub>8</sub> produced               | ---  |
| *Poison Canyon-Beacon Hill-Davenport-Dog-Flea | 19,20,21 T13N R10W | surface-300          | Jmb   | primary                  | over 1.3 mill lbs U <sub>3</sub> O <sub>8</sub> produced        | Hilpert (1969), Rapaport (1963), Tessendorf (1980) |
| *Marquez                                      | 23 T13N R9W        | 1800-1875            | Jmb   | primary                  | 3,757,847 lbs U <sub>3</sub> O <sub>8</sub> produced            | Weege (1963), Rapaport (1963)                      |
| *Hogan  | 14 T13N R9W        | 300-340              | Jmb   | primary                  | 678,510 lbs U <sub>3</sub> O <sub>8</sub> produced              | Rapaport (1963)                                    |
| Sec. 13                                       | 13 T13N R9W        | ---                  | Jmb   | primary                  | ---   | ---  |
| *Sec. 24                                      | 24 T13N R9W        | 400-500              | Jmb   | primary                  | 37,693 lbs U <sub>3</sub> O <sub>8</sub> produced               | ---  |
| *San Mateo                                    | 30 T13N R9W        | ---                  | Jmb   | primary                  | over 2.8 mill lbs U <sub>3</sub> O <sub>8</sub> produced        | Rapaport (1963)                                    |
| Sec. 29,32                                    | 29,32 T13N R9W     | ---                  | Jmb   | primary                  | ---   | ---  |
| Sec. 19                                       | 19 T13N R9W        | 500                  | Jmb   | primary                  | ---   | ---  |
| Pat (Dakota)                                  | 4 T13N R10W        | surface              | Kd,Jm | ---                      | 12,645 lbs produced   | ---  |
| +La Jara Mesa                                 | 1,12 T12N R9W      | ---                  | Jmb   | primary                  | 2.5 mill lbs U <sub>3</sub> O <sub>8</sub> reserves at 0.2-0.3% | NHBMMR files, Homestake Mining Co. files           |
| Sec. 1  | 1 T14N R11W        | 600-700              | Jmb   | ---                      | ---   | Pathfinder files, 1981                             |
| Sec. 5,7,8                                    | 5,7,8, T14N R10W   | 1160-1200            | Jmb   | primary                  | over 1 mill lbs reserves delineated                             | Pathfinder files, 1981                             |
| Sec. 17,18                                    | 17,18 T14N R10W    | 800-1000, 1400       | Jmb   | primary                  | over 100,000 lbs reserves delineated                            | Pathfinder files, 1981                             |

\* Produced, mineralization may still be present.

+ Mine plan under consideration.

#### Ambrosia subdistrict-Dakota orebodies (redistributed ore). Production data from McLemore (1983a).

| Property            | Location     | Estimated depth (ft) | Production lbs U <sub>3</sub> O <sub>8</sub> | Average grade % U <sub>3</sub> O <sub>8</sub> | Comments |
|---------------------|--------------|----------------------|--|---|----------|
| Febco (Small Stake) | 31 T14N R10W | surface              | (included in Silver Spur mine)               | ---   | ---      |
| Silver Spur         | 31 T14N R10W | surface              | 29,454                                       | 0.25  | ---      |
| Junior              | 4 T13N R10W  | surface              | (included in Pat mine)                       | ---   | ---      |
| Sec. 5              | 5 T13N R10W  | surface              | 54   | 0.12  | ---      |

Also minor anomalies or occurrences in 2 T13N R11W; 5 T13N R10W; 34 T14N R11W

## Ambrosia Lake subdistrict

| Property   | Location                             | Estimated depth (ft) | Host | Dominant type of deposit              | Estimated size  | References  |
|--|--------------------------------------|----------------------|------|---------------------------------------|---|---|
| *Mary 1, Sec. 10,12,<br>Dysart 1,2                             | 10,11,12 T14N R10W                   | 400-600              | JMW  | primary,<br>redistributed             | over 5 mill lbs U <sub>3</sub> O <sub>8</sub><br>produced   | Cronk (1963)  |
| *Buckey, Sec. 13, 17   | 13,14 T14N R10W,<br>17,18 T14N, R9W  | 350-400              | JMW  | primary                               | over 3 mill lbs U <sub>3</sub> O <sub>8</sub><br>produced   | ---   |
| *Sec. 14,15,22,<br>23,24,25                                    | 14,15,22,23,24,25<br>T14N R10W       | 600-800              | JMW  | primary,<br>redistributed,<br>remnant | over 38 mill lbs U <sub>3</sub> O <sub>8</sub><br>produced  | Gould and others (1963)   |
| Sec. 21,28,27,<br>26, W1/2 36                                  | 21,27,26,28,W1/2 36<br>T14N R10W     | 400-600              | JMW  | remnant                               | over 3.5 mill lbs<br>U <sub>3</sub> O <sub>8</sub> reserves<br>delineated   | Smith and Peterson (1980),<br>McGammon and others (1986),<br>Pathfinder files, 1981 |
| *Sec. 30,30W,32,<br>29, 36 (VCA)                               | 30,32,31,29<br>T14N R9W, 36 T14N R8W | 800                  | JMW  | primary,<br>redistributed             | ---   | Clary and others (1963)   |
| *Ann Lee, Sec. 27  | 26,27 T14N R9W                       | 700-750              | JMW  | primary,<br>redistributed             | over 8 mill lbs U <sub>3</sub> O <sub>8</sub><br>produced   | Hazlett and Kreek (1963),<br>Squyres (1963, 1980)                                   |
| *Sec. 33,26, John<br>Billy, Sandstone,<br>Sec. 35,1, cliffside | 33,34,35,36<br>T14N R9W              | 1500                 | JMW  | primary,<br>redistributed,<br>remnant | over 10 mill lbs U <sub>3</sub> O <sub>8</sub><br>produced  | Hazlett and Kreek (1963),<br>Harmon and Taylor (1963),<br>Foster and Quintanar      |
| Enerdyne   | 31 T14N R8W                          | 1560                 | JMW  | primary                               | ---   | ---   |
| Heirich  | 32 T14N R8W                          | 1880                 | JMW  | primary                               | ---   | ---   |
| Johnny H   | 7,18,17 T13N R8W                     | 1300-1400            | JMW  | primary,<br>redistributed             | about 2 mill lbs U <sub>3</sub> O <sub>8</sub><br>produced, 1.5 mill lbs<br>U <sub>3</sub> O <sub>8</sub> remaining reserves                        | McLemore (1983a),<br>Falkowski (1980a, b)   |
| Roca Honda   | 9 T13N R8W                           | 1800-2000            | JMW  | primary                               | ---   | ---   |
| Lee  | 17,16 T13N R8W                       | 1800                 | JMW  | primary, minor<br>redistributed       | ---   | ---   |
| Sec. 10  | 10 T13N R8W                          | ---                  | JMW  | primary                               | ---   | NMBMMR files  |
| Fernandez-Main Ranch   | 15,23 T13N R8W                       | 2500-3000            | JMW  | primary                               | 8-9 mill lbs U <sub>3</sub> O <sub>8</sub><br>reserves  | Holmquist (1970)  |
| Sec. 14,13   | 14,13 T13N R8W                       | ---                  | JMW  | primary                               | ---   | ---   |
| *Mt. Taylor  | 23,24,25,30,31,32<br>T13N R8W        | 3100-3400            | JMW  | primary,<br>redistributed(?)          | 120 mill lbs U <sub>3</sub> O <sub>8</sub> at<br>0.5% U <sub>3</sub> O <sub>8</sub> reserves<br>(including the<br>Fernandez-Main<br>Ranch property) | NMBMMR files, Chevron<br>Resources Corp.-files                                      |

\* Produced, mineralization may still be present.

Brushy Basin-Poison Canyon Ore. NOTE: McCommon et al. (1986) consider the Poison Canyon sandstone (of economic usage) to be part of the Westwater Canyon Member, not the Brushy Basin Member.

| Property                                      | Location           | Estimated depth (ft) | Host   | Dominant type of deposit | Estimated size  | References   |
|---|--------------------|----------------------|--------|--------------------------|---|--|
| *Bobcat-Blue Peak                             | 24 T13N R10W       | surface              | Jmb    | primary                  | 44,206 lbs U <sub>3</sub> O <sub>8</sub> produced               | ---  |
| *Poison Canyon-Beacon Hill-Davenport-Dog Flea | 19,20,21 T13N R10W | surface-300          | Jmb    | primary                  | over 1.3 mill lbs U <sub>3</sub> O <sub>8</sub> produced        | Hilpert (1969), Rapaport (1963), Tessendorf (1980) |
| *Marquez                                      | 23 T13N R9W        | 1800-1875            | Jmb    | primary                  | 3,757,847 lbs U <sub>3</sub> O <sub>8</sub> produced            | Weege (1963), Rapaport (1963)                      |
| *Hogan  | 14 T13N R9W        | 300-340              | Jmb    | primary                  | 678,510 lbs U <sub>3</sub> O <sub>8</sub> produced              | Rapaport (1963)                                    |
| Sec. 13                                       | 13 T13N R9W        | ---                  | Jmb    | primary                  | ---   | ---  |
| *Sec. 24                                      | 24 T13N R9W        | 400-500              | Jmb    | primary                  | 37,693 lbs U <sub>3</sub> O <sub>8</sub> produced               | ---  |
| *San Mateo                                    | 30 T13N R9W        | ---                  | Jmb    | primary                  | over 2.8 mill lbs U <sub>3</sub> O <sub>8</sub> produced        | Rapaport (1963)                                    |
| Sec. 29,32                                    | 29,32 T13N R9W     | ---                  | Jmb    | primary                  | ---   | ---  |
| Sec. 19                                       | 19 T13N R9W        | 500                  | Jmb    | primary                  | ---   | ---  |
| Pat (Dakota)                                  | 4 T13N R10W        | surface              | Kd, Jm | ---                      | 12,645 lbs produced   | ---  |
| +La Jara Mesa                                 | 1,12 T12N R9W      | ---                  | Jmb    | primary                  | 2.5 mill lbs U <sub>3</sub> O <sub>8</sub> reserves at 0.2-0.3% | HNBMR files, Homestake Mining Co. files            |
| Sec. 1  | 1 T14N R11W        | 600-700              | Jmb    | ---                      | ---   | Pathfinder files, 1981                             |
| Sec. 5,7,8                                    | 5,7,8, T14N R10W   | 1160-1200            | Jmb    | primary                  | over 1 mill lbs reserves delineated                             | Pathfinder files, 1981                             |
| Sec. 17,18                                    | 17,18 T14N R10W    | 800-1000, 1400       | Jmb    | primary                  | over 100,000 lbs reserves delineated                            | Pathfinder files, 1981                             |

\* Produced, mineralization may still be present.

+ Mine plan under consideration.

Ambrosia subdistrict-Dakota orebodies (redistributed ore). Production data from McLemore (1983a).

| Property            | Location     | Estimated depth (ft) | Production lbs U <sub>3</sub> O <sub>8</sub> | Average grade % U <sub>3</sub> O <sub>8</sub> | Comments |
|---------------------|--------------|----------------------|--|---|----------|
| Febco (Small Stake) | 31 T14N R10W | surface              | (included in Silver Spur mine)               | ---   | ---      |
| Silver Spur         | 31 T14N R10W | surface              | 29,454                                       | 0.25  | ---      |
| Junior              | 4 T13N R10W  | surface              | (included in Pat mine)                       | ---   | ---      |
| Sec. 5              | 5 T13N R10W  | surface              | 54   | 0.12  | ---      |

Also minor anomalies or occurrences in 2 T13N R11W; 5 T13N R10W; 34 T14N R11W

Brushy Basin-Poison Canyon Ore. NOTE: McCammon et al. (1986) consider the Poison Canyon sandstone (of economic usage) to be part of the WestWater Canyon Member, not the Brushy Basin Member.

| Property                                      | Location           | Estimated depth (ft) | Host  | Dominant type of deposit | Estimated size  | References   |
|---|--------------------|----------------------|-------|--------------------------|---|--|
| *Bobcat-Blue Peak                             | 24 T13N R10W       | surface              | Jmb   | primary                  | 44,206 lbs U <sub>3</sub> O <sub>8</sub> produced               | ---  |
| *Poison Canyon-Beacon Hill-Davenport-Dog-Flea | 19,20,21 T13N R10W | surface-300          | Jmb   | primary                  | over 1.3 mill lbs U <sub>3</sub> O <sub>8</sub> produced        | Hilpert (1969), Rapaport (1963), Tessendorf (1980) |
| *Marquez                                      | 23 T13N R9W        | 1800-1875            | Jmb   | primary                  | 3,757,847 lbs U <sub>3</sub> O <sub>8</sub> produced            | Weege (1963), Rapaport (1963)                      |
| *Hogan  | 14 T13N R9W        | 300-340              | Jmb   | primary                  | 678,510 lbs U <sub>3</sub> O <sub>8</sub> produced              | Rapaport (1963)                                    |
| Sec. 13                                       | 13 T13N R9W        | ---                  | Jmb   | primary                  | ---   | ---  |
| *Sec. 24                                      | 24 T13N R9W        | 400-500              | Jmb   | primary                  | 37,693 lbs U <sub>3</sub> O <sub>8</sub> produced               | ---  |
| *San Mateo                                    | 30 T13N R9W        | ---                  | Jmb   | primary                  | over 2.8 mill lbs U <sub>3</sub> O <sub>8</sub> produced        | Rapaport (1963)                                    |
| Sec. 29,32                                    | 29,32 T13N R9W     | ---                  | Jmb   | primary                  | ---   | ---  |
| Sec. 19                                       | 19 T13N R9W        | 500                  | Jmb   | primary                  | ---   | ---  |
| Pat (Dakota)                                  | 4 T13N R10W        | surface              | Kd,Jm | ---                      | 12,645 lbs produced   | ---  |
| +La Jara Mesa                                 | 1,12 T12N R9W      | ---                  | Jmb   | primary                  | 2.5 mill lbs U <sub>3</sub> O <sub>8</sub> reserves at 0.2-0.3% | NNBMMR files, Homestake Mining Co. files           |
| Sec. 1  | 1 T14N R11W        | 600-700              | Jmb   | ---                      | ---   | Pathfinder files, 1981                             |
| Sec. 5,7,8                                    | 5,7,8, T14N R10W   | 1160-1200            | Jmb   | primary                  | over 1 mill lbs reserves delineated                             | Pathfinder files, 1981                             |
| Sec. 17,18                                    | 17,18 T14N R10W    | 800-1000, 1400       | Jmb   | primary                  | over 100,000 lbs reserves delineated                            | Pathfinder files, 1981                             |

\* Produced, mineralization may still be present.

+ Mine plan under consideration.

#### Ambrosia subdistrict-Dakota orebodies (redistributed ore). Production data from McLemore (1983a).

| Property            | Location     | Estimated depth (ft) | Production (lbs U <sub>3</sub> O <sub>8</sub> ) | Average grade % U <sub>3</sub> O <sub>8</sub> | Comments |
|---------------------|--------------|----------------------|---|---|----------|
| Febco (Small Stake) | 31 T14N R10W | surface              | (included in Silver Spur mine)                  | ---   | ---      |
| Silver Spur         | 31 T14N R10W | surface              | 29,454  | 0.25  | ---      |
| Junior              | 4 T13N R10W  | surface              | (included in Pat mine)                          | ---   | ---      |
| Sec. 5              | 5 T13N R10W  | surface              | 54  | 0.12  | ---      |

All data are based on occurrences in 2 T13N R11W, 5 T13N R10W, 34 T14N R11W

| Leguna subdistrict                    |                                |                      |      |                                |  |  |
|---------------------------------------|--------------------------------|----------------------|------|--------------------------------|--|--|
| Property <sup>1</sup>                 | Location                       | Estimated depth (ft) | Host | Dominant type of deposit       | Estimated size   | References   |
| JJ-1 (L Bar)                          | 23, 24 T11N R5W                | 650-700              | Jmbj | primary                        | 2.1 mill lbs U <sub>3</sub> O <sub>8</sub> produced, 13.9 mill lbs U <sub>3</sub> O <sub>8</sub> reserves at 0.16% U <sub>3</sub> O <sub>8</sub> | Sohio files (1981) <sup>2</sup> , Jacobsen (1980)        |
| St. Anthony open pit & shaft          | 24 T11N R5W<br>19, 30 T10N R9W | surface              | Jmbj | primary, possibly some remnant | Over 2,500,000 lbs U <sub>3</sub> O <sub>8</sub> produced  | Baird and others (1980), Sohio files (1981) <sup>2</sup> |
| Bibo rim cuts                         | 29 T10N R4W                    | surface              | Jmbj | primary                        | ---  | ---  |
| Windwhip rim cuts, in-situ            | 34, 35 T11N R5W                | surface-250          | Jmbj | primary                        | included with Jackpile-Paguate   | Holen and Hatchell (1986)                                |
| Walter rim cut                        | 35 T11N R5W                    | surface              | Jmbj | primary                        | included with Jackpile-Paguate   | ---  |
| Jackpile-Paguate open pits & declines | T10, T11N R5W                  | surface-300          | Jmbj | primary                        | 26.0 mill tons of ore yielding 100 mill lbs of U <sub>3</sub> O <sub>8</sub>   | Kittel (1963), Hoppe (1970), Beck and others (1980)      |
| Oak Creek rim cut                     | 11 T10N R5W                    | surface              | Jmbj | primary                        | included in Jackpile-Paguate   | ---  |
| Woodrow                               | 36 T11N R5W<br>1 T10N R5W      | 360                  | Jm   | breccia pipe                   | 134,014 lbs U <sub>3</sub> O <sub>8</sub> produced, average grade of 1.26%   | Wylie (1963)   |

**SHAFT**

<sup>1</sup> All mines have produced, mineralized zones may still be present.  
<sup>2</sup> Sohio files (1981) available for inspection at NMBMMR Geotechnical Information Center.

**ADIT OR DECLINE**

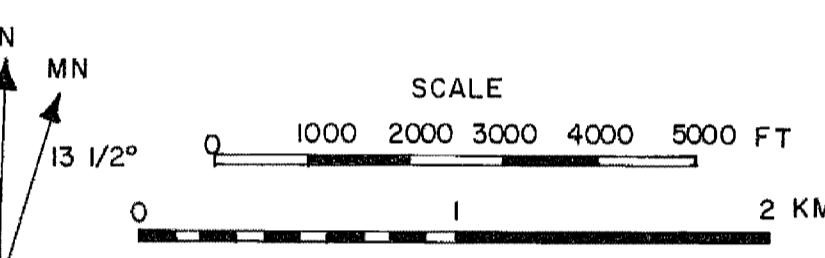
APPROXIMATE LIMITS OF URANIUM MINERALIZATION IN JACKPILE SANDSTONE

OPEN PIT BOUNDARIES, DASHED WHERE EXPECTED TO MINE

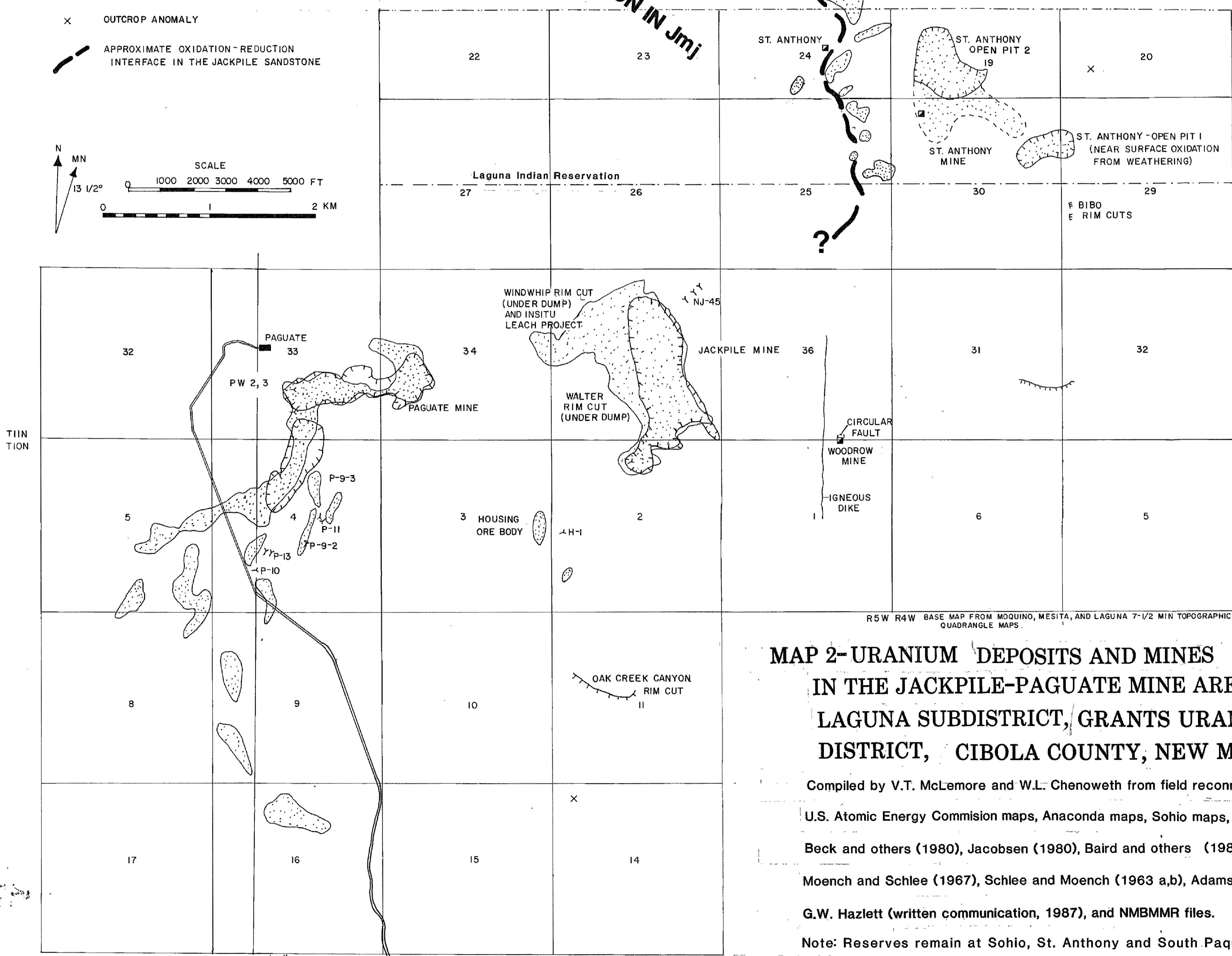
RIM CUT OR TRENCH

OUTCROP ANOMALY

APPROXIMATE OXIDATION-REDUCTION INTERFACE IN THE JACKPILE SANDSTONE



SOHIO-WESTERN MILL  
J J 1  
? **OXIDATION IN Jmj** **REDUCTION IN Jmj**

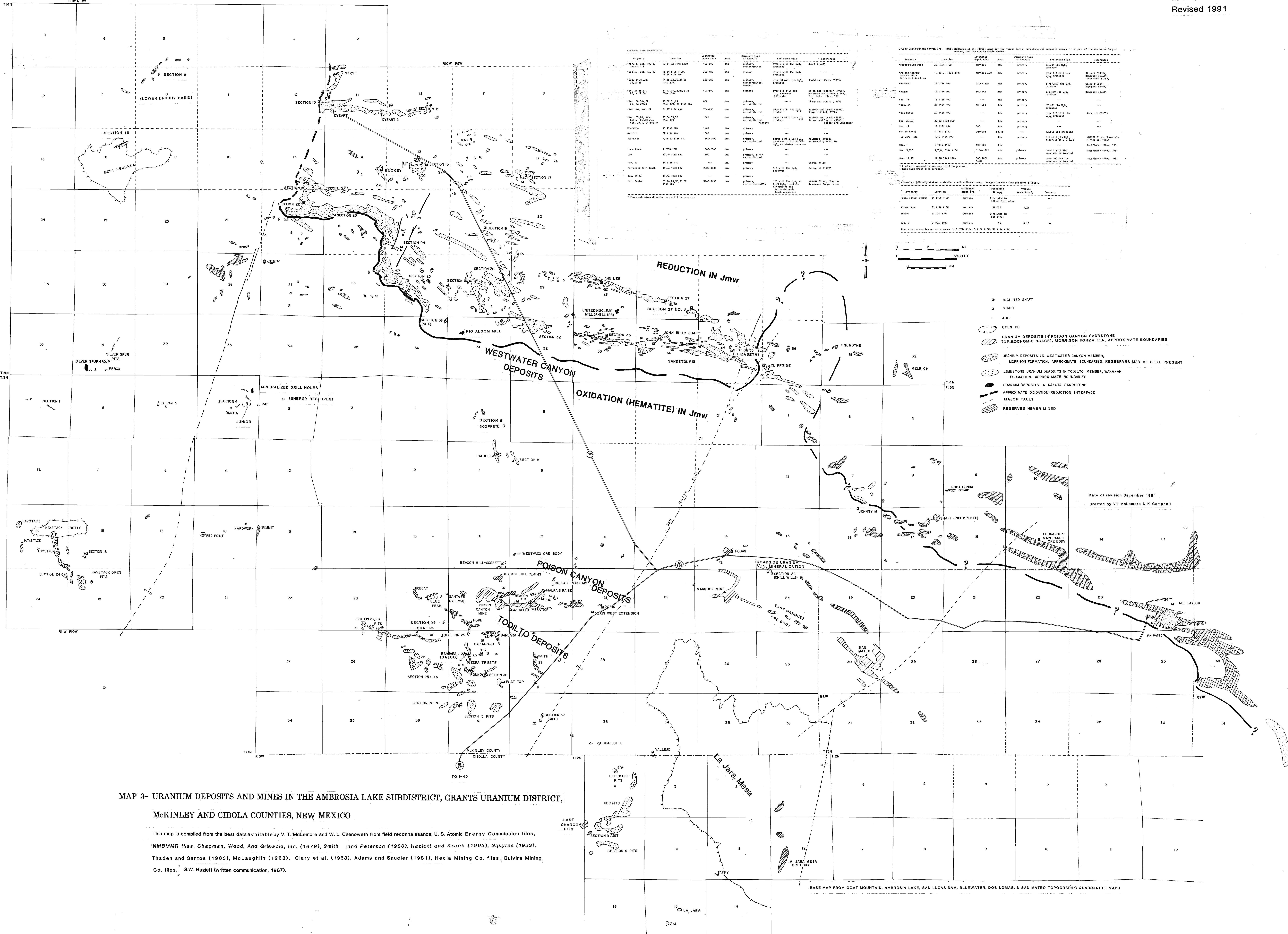


## OPEN FILE 353 MAP 2 REVISED 1991

### MAP 2-URANIUM DEPOSITS AND MINES IN THE JACKPILE-PAGUATE MINE AREA, LAGUNA SUBDISTRICT, GRANTS URANIUM DISTRICT, CIBOLA COUNTY, NEW MEXICO.

Compiled by V.T. McLemore and W.L. Chenoweth from field reconnaissance, U.S. Atomic Energy Commission maps, Anaconda maps, Sohio maps, Beck and others (1980), Jacobsen (1980), Baird and others (1980), Moench and Schlee (1967), Schlee and Moench (1963 a,b), Adams and Saucier (1981), G.W. Hazlett (written communication, 1987), and NMBMMR files.

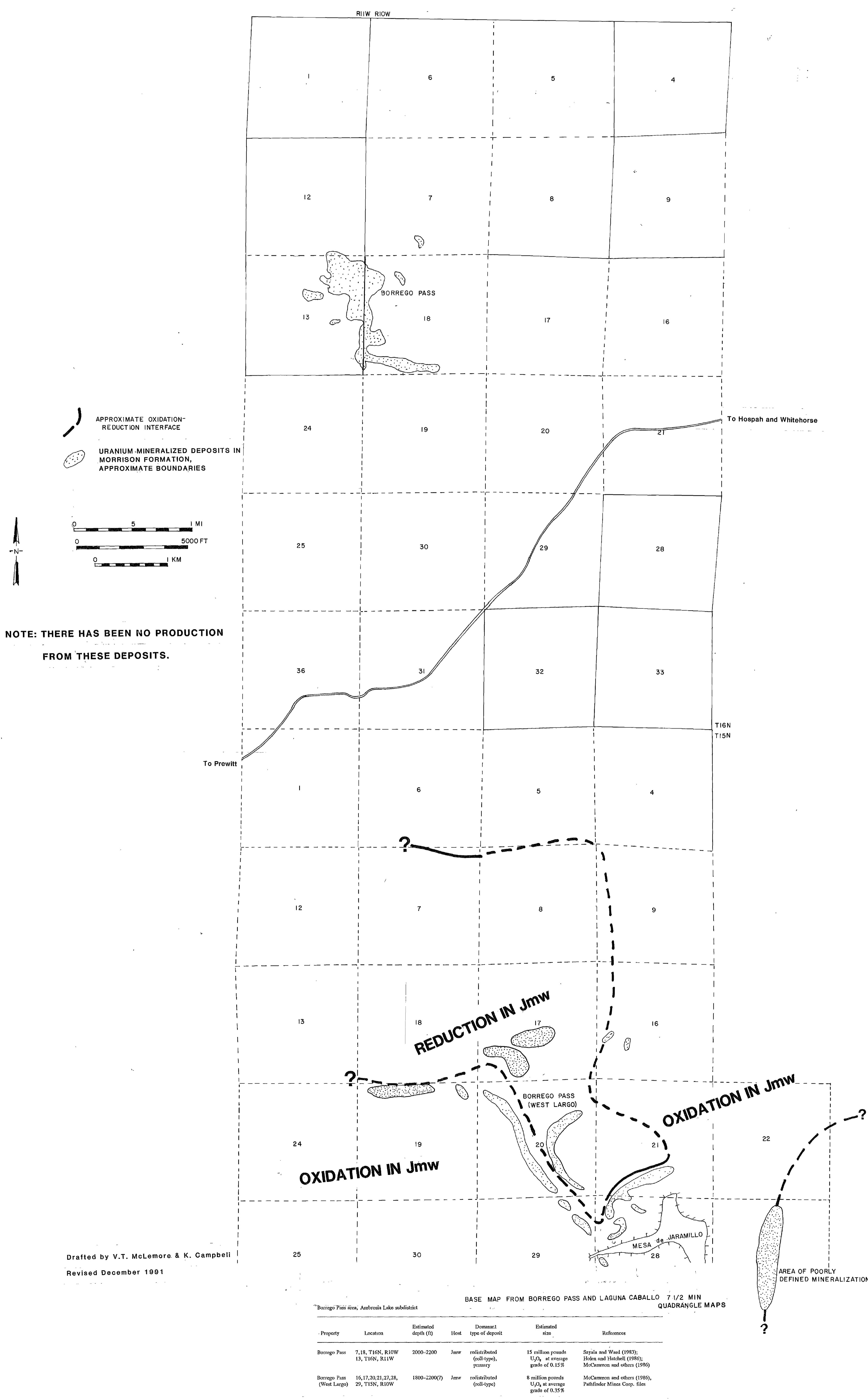
Note: Reserves remain at Sohio, St. Anthony and South Paquate.



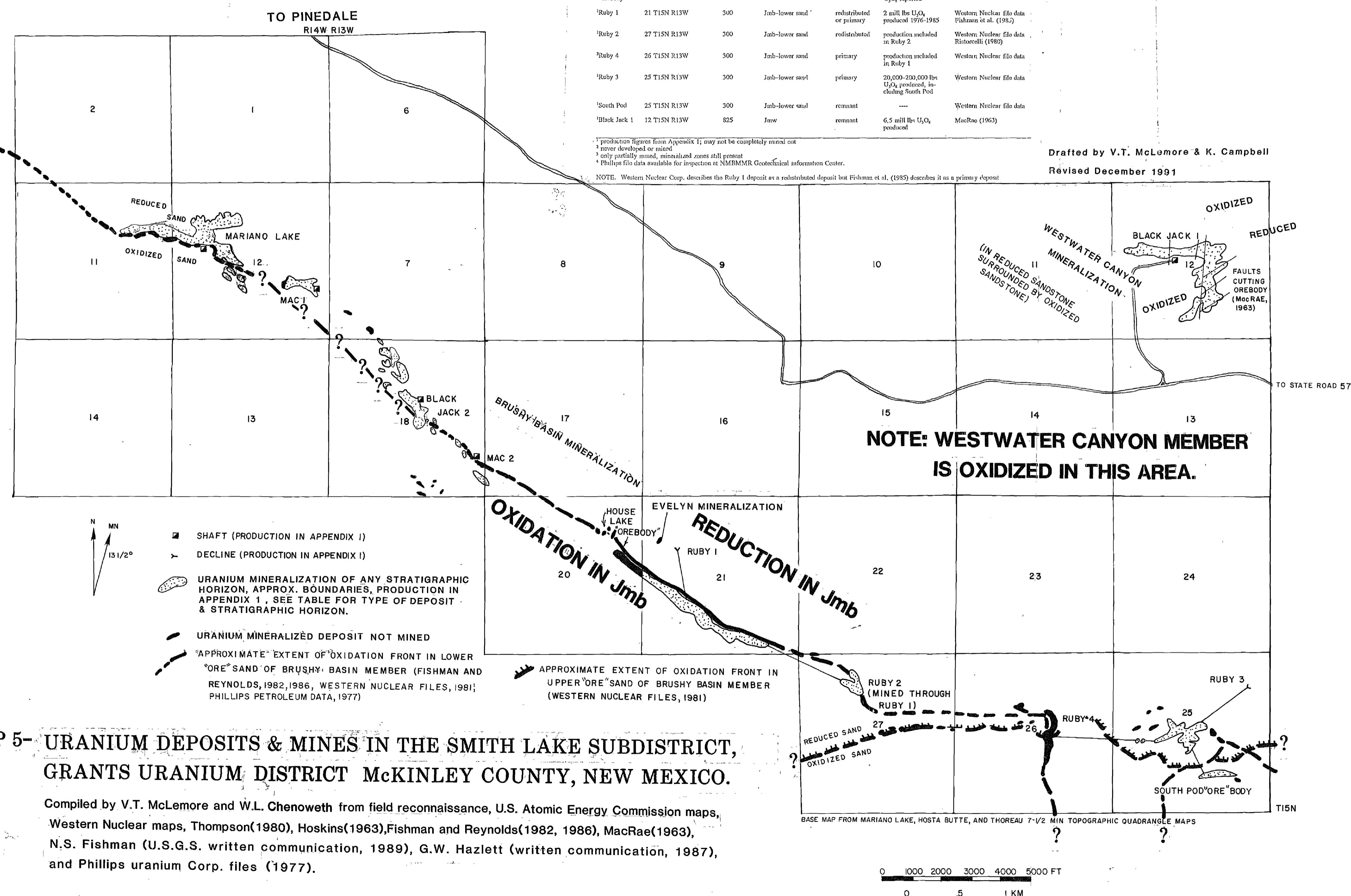
OPEN FILE 353  
MAP 4  
REVISED 1991

MAP 4- URANIUM DEPOSITS IN THE BORREGO PASS AREA, AMBROSIA LAKE  
SUBDISTRICT, GRANTS URANIUM DISTRICT, McKINLEY COUNTY, NEW MEXICO

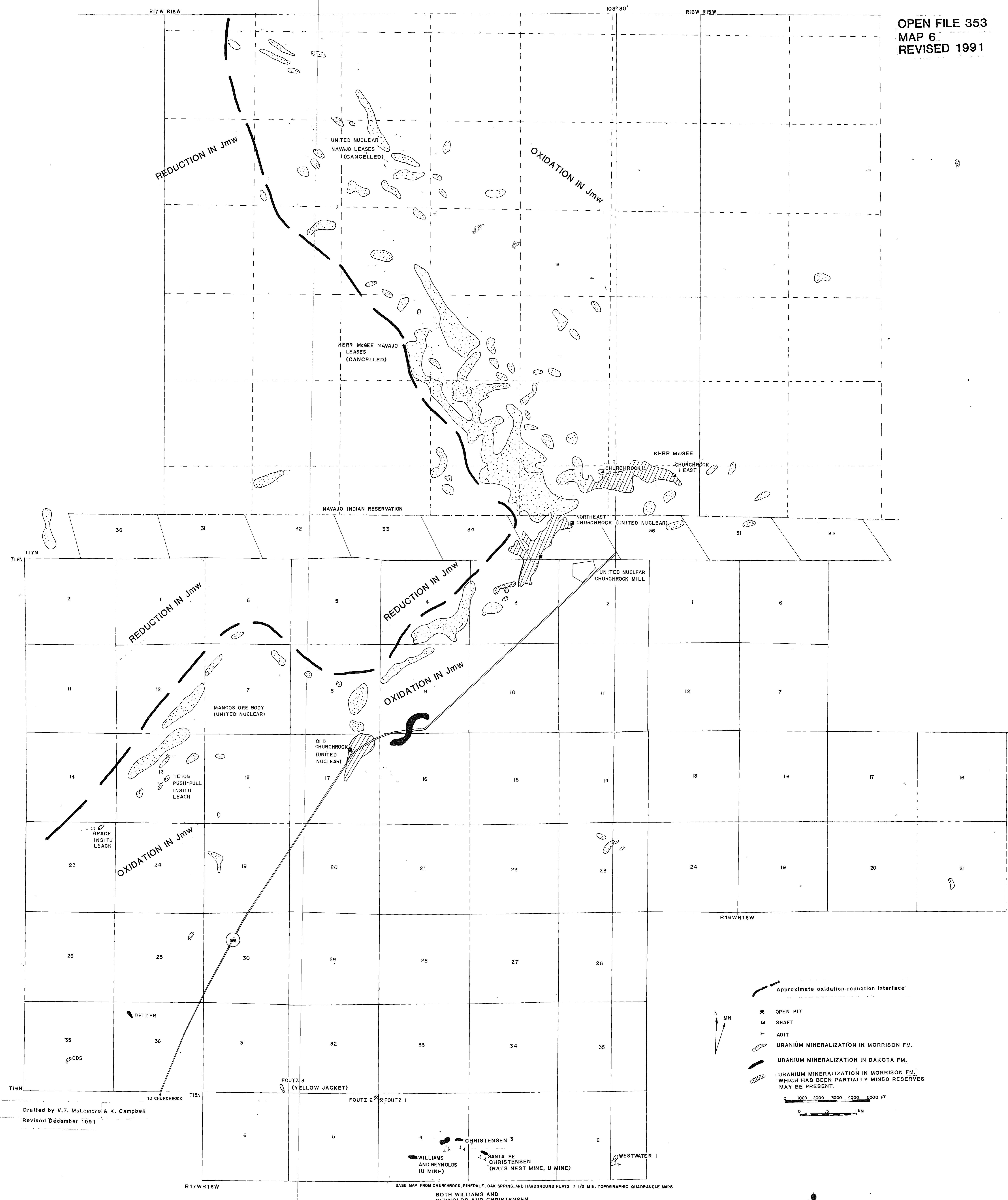
Compiled by V. T. McLemore and W. L. Chenoweth from Chapman, Wood, and Griswold, Inc. (1979), Quivira Mining Co. files, NMBMMR files, Holen and Hatchell (1986), Adams and Saucier (1981), Sayala and Ward (1983), Pathfinder Mines Corp. files



**OPEN FILE 353**  
**MAP 5**  
**REVISED 1991**



There is some controversy between the USGS (McCommon et al., 1986) and industry (Place et al., 1980) regarding the stratigraphic position of the ore in the Mariano Lake trend. Some industry geologists call the ore bearing sandstone Poison Canyon. The USGS then places it in the Westwater Canyon Member. Other geologists (Fishman and Reynolds, 1986) and the authors regard the ore bearing sandstone as an unnamed sandstone in the lower Brushy Basin Member. McLemore and Chenoweth (1989, Table 3) placed the deposits in the Westwater Canyon Member to be consistent with McCommon et al., 1986.



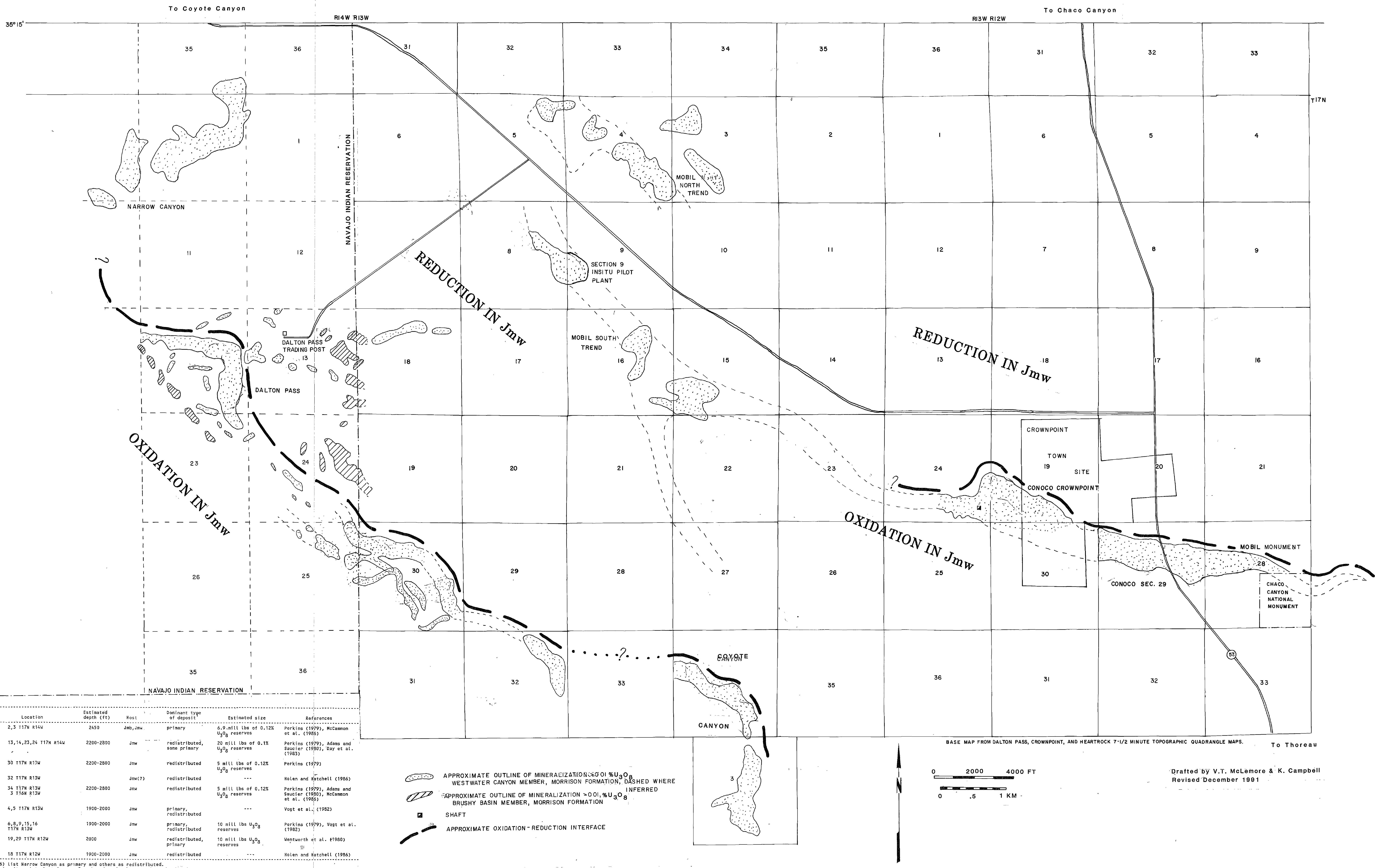
MAP 6- URANIUM DEPOSITS AND MINES IN THE CHURCHROCK SUBDISTRICT, GRANTS URANIUM DISTRICT, MCKINLEY COUNTY, NEW MEXICO.

Compiled by V.T. McLemore and W.L. Chenoweth from field reconnaissance, NMBMMR files, U.S. Atomic Energy Commission files, Adams and Saucier (1981), Peterson (1980), Fishman and Reynolds (1983), United Nuclear Corp. files, and G.W. Hazlett (written communication, 1987).

| Churchrock subdistrict (Produced, reserves may be present) |                               |                      |                       |   |   |
|--|-------------------------------|----------------------|-----------------------|---|---|
| Property   | Location                      | Estimated depth (ft) | Host                  | Dominant type of deposit                                    | Estimated size  |
| Williams Mine Lease (Churchrock 2,3)                       | 21,27,35 T17N R16W            | 2000-2500            | Jew                   | reduced, primary  | over 35 mi² Be<br>minerals, 100,000 lbs<br>U <sub>3</sub> O <sub>8</sub> produced |
| *Churchrock 1 and 10 (Kerr McGee)                          | 35, 36 T17N R16W              | 1500-1800            | Jew                   | reduced, primary  | about 5 mi² Be<br>U <sub>3</sub> O <sub>8</sub> produced                          |
| *NB Churchrock (United Nuclear)                            | 35 T17N R16W                  | 1700-1800            | Jew                   | reduced, primary  | about 12 mi² Be<br>U <sub>3</sub> O <sub>8</sub> produced                         |
| Section 3  | 3 T17N R16W                   | 1550-1600            | Jew                   | reduced, primary  | part of NE<br>Churchrock  |
| Section 4  | 4 T17N R16W                   | 1550-1600?           | Jew                   | reduced, primary  | —   |
| *Old Churchrock  | 8,17 T17N R16W                | 800-900              | Jew, Job, Kd, remnant | about 900,000 lbs<br>U <sub>3</sub> O <sub>8</sub> produced | NMBMMR files  |
| Section 7  | 7, T17N R16W                  | 260-1020             | Jew                   | reduced, primary  | —   |
| Section 7, 12<br>(Manos)                                   | 7,13 T17N R16W                | 360-1020             | Jew                   | reduced, primary  | McLemore (1983a)  |
| *Teton Sec. 13<br>(in situ leach)                          | 13 T17N R16W                  | 1500                 | Jew                   | primary, reduced  | Bateson (1980),<br>Holen and Headell (1986)                                       |
| *Grace Site I<br>(in situ leach)                           | 23 T17N R16W                  | 500                  | Jew                   | 7   | —<br>about 200 lbs U <sub>3</sub> O <sub>8</sub><br>produced                      |
| Section 19   | 19 T17N R16W                  | —                    | Jew                   | reduced/reduced?  | McLemore (1983)   |
| Section 23   | 23 T17N R16W                  | 400-500              | Jew?                  | reduced/reduced   | —   |
| Section 21   | 21 T17N R16W                  | —                    | Jew?                  | remnant?  | —   |
| *Pont 1, 2, 3  | 4,7 T17N R16W<br>31 T17N R16W | surface              | Jew                   | remnant   | Hibert (1986),<br>McCausland et al. (1986)  |
| *Westwater   | 2 T17N R16W                   | 164                  | Jew                   | remnant   | Hibert (1986),<br>McCausland et al. (1986)  |
| *CDS   | 35 T17N R16W                  | surface              | Jew                   | present   | 48 lbs U <sub>3</sub> O <sub>8</sub> produced                                     |

| Churchrock subdistrict-Olds produced (Prodificated area). Production data from Christensen (1980). Mine shipped from both Williams and Reynolds and Christensen mines are identified in the REC ore receipts as the U values. |                  |                      |                      |                                       |   |
|---|------------------|----------------------|----------------------|---------------------------------------|---|
| Property  | Location         | Estimated depth (ft) | Host                 | grade % U <sub>3</sub> O <sub>8</sub> | Comments  |
| Old Churchrock  | 8,9,16 T16N R16W | 600-900              | Kd                   | 0.21                                  | mine produced ore from both Kd and Job, and never way for in situ leach project |
| Section 9, 16   | 9,16 T16N R16W   | 320-480              | Reserves-<br>150,300 | 0.19                                  | ...   |
| Delter  | 36 T15N R17W     | surface              | none                 | ...                                   | ...   |
| Williams and<br>Christensen (U mine)  | 4 T15N R16W      | surface-20           | 3,954                | 0.15                                  | ...   |
| Christensen <sup>1</sup><br>(U mine)  | 4 T15N R16W      | 100                  | 4,556                | 0.18                                  | ...   |
| Santa Fe Christensen<br>(Rats Nest mine, U mine)  | 3 T15N R16W      | 100                  | 1,836                | 0.28                                  | ...   |
| Hopback 3-5   | 12 T15N R17W     | surface              | 24,234               | 0.19                                  | ...   |
| Diamond No. 2<br>(Includes Mike Smith<br>Leach Project, U mine<br>and K. Recent lease)  | 33 T15N R17W     | surface-300          | 244,959              | 0.22                                  | mineralized zones<br>extends into sec. 34                                       |
| Sec. 28-E, Recent   | 28 T15N R17W     | surface              | 3,359                | 0.20                                  | ...   |
| Also minor anomalies or occurrences in 33, 34 T15N R17W; 36 T16N R17W (black background); 15 T15N R16W  |                  |                      |                      |                                       |   |

OPEN FILE 353  
MAP 7  
Revised 1991



MAP 7- URANIUM DEPOSITS IN THE CROWNPOINT AREA, GRANTS URANIUM DISTRICT, MCKINLEY COUNTY, NEW MEXICO.

Compiled by V. T. McLemore and W. L. Chenoweth from field reconnaissance, NMBMMR files, Adams and Saucier (1981), Wentworth et al. (1980), G.W. Hazlett (written communication, 1987), Pathfinder Mines Corp. files.

The only production from this area was from Mobil Oil Corp.'s in-situ pilot plant (Appendix 1).

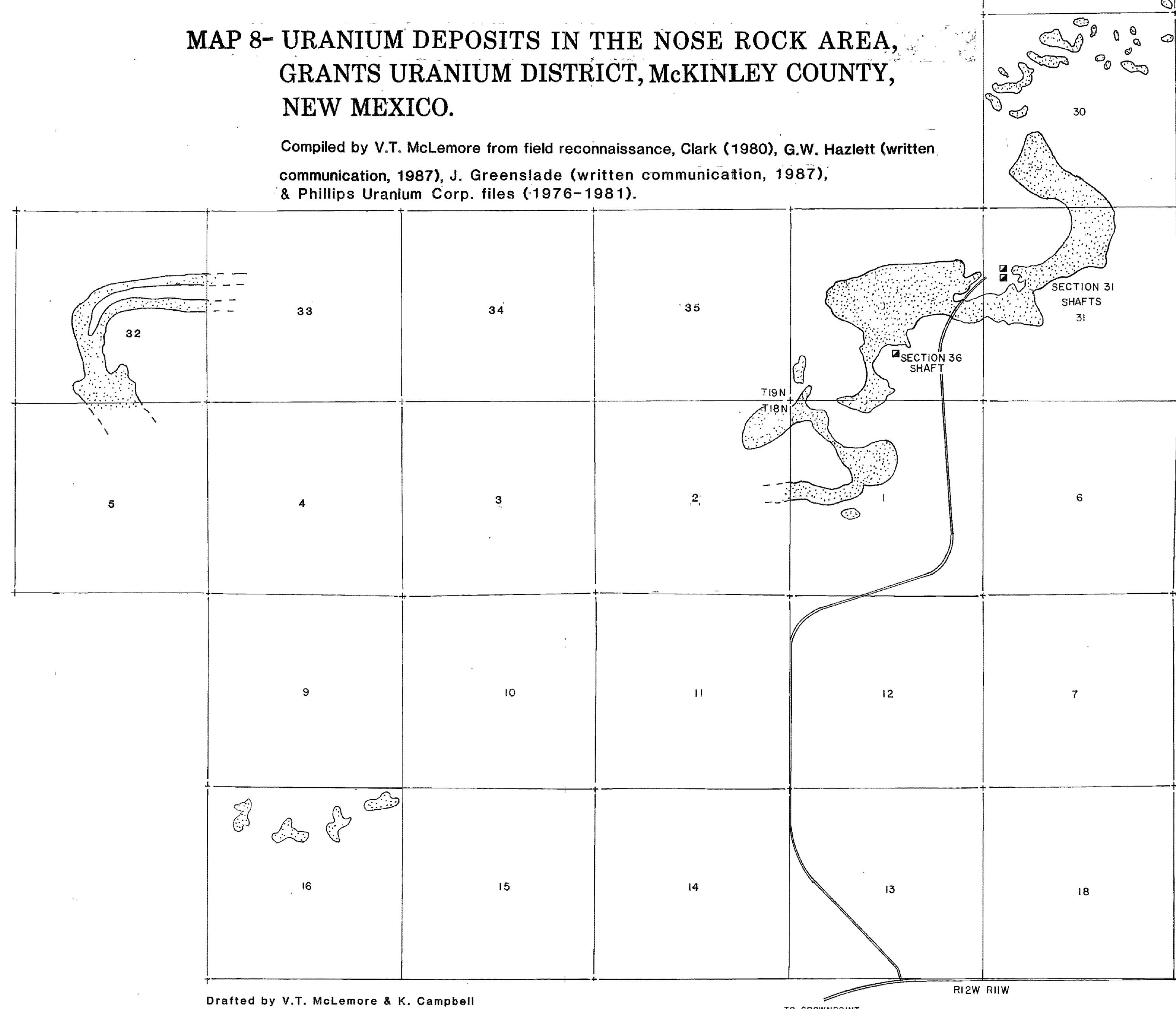
Data are incomplete to show the extent of the oxidation-reduction interface. McCammon et al. (1986) places the interface further to the northeast which infers that Mobil's North and South Trend are redistributed deposits. However, some geologists believe an interface exists along the Dalton Pass-Canyon trend which infers that some of these deposits are primary. The Narrow Canyon deposit is primary (McCammon et al. 1986). The authors are investigating the extent of the interface at different stratigraphic intervals within the Morrison Formation.

**OPEN FILE 353**  
**MAP 8**  
**REVISED 1991**

| Nose Rock area  |   |                      |      |                           |   |   |
|---|---|----------------------|------|---------------------------|---|---|
| Property  | Location                                      | Estimated depth (ft) | Host | Dominant type of deposit  | Estimated size  | References <sup>2</sup>                             |
| Mine Unit #1  | 31 T19N R11W,<br>1 T18N R12N,<br>36 T18N R12N | 3100                 | Jmw  | primary,<br>redistributed | 36.2 mill lbs U <sub>3</sub> O <sub>8</sub>   | Phillips files (1981),<br>Clark (1980)              |
| Mine Unit #2  | 10, 15 T19N R11W                              | 2750-2850            | Jmw  | primary                   | 9.7 mill lbs U <sub>3</sub> O <sub>8</sub> at<br>0.167%; an additional<br>1 mill lbs U <sub>3</sub> O <sub>8</sub> at<br>0.061% | Phillips files (1981)                               |
| Mine Unit #3  | 30 T19N R11W                                  | 3000-3150            | Jmw  | primary                   | 12.4 mill lbs U <sub>3</sub> O <sub>8</sub> at<br>0.1%; an additional<br>1.4 mill lbs U <sub>3</sub> O <sub>8</sub> at<br>0.06% | Phillips files (1981)                               |
| Sec. 18, 19   | 18, 19 T19N R11W                              | 3100                 | Jmw  | primary                   | —   | Phillips files (1981)                               |
| Sec. 16<br>proposed in-situ<br>leach project              | 16 T18N R12W                                  | 2600-2700            | Jmw  | primary                   | —   | Phillips files (1981)                               |
| <sup>1</sup> Sec. 32<br>proposed in-situ<br>leach project | 32 T19N R12W                                  | 3000-3200            | Jmw  | primary                   | 10-15 mill lbs U <sub>3</sub> O <sub>8</sub>  | Phillips files (1976),<br>Holen and Hatchell (1986) |

I not shown on map due to lack of data

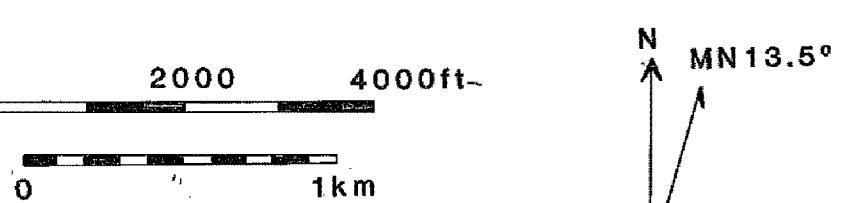
<sup>2</sup> Phillips files are available for public inspection at the NMBMMR Geotechnical Information Center.



P FROM BECENTI LAKE, NOSE ROCK, AND SEVEN LAKES NW 7 1/2" TOPOGRAPHIC QUADRANGLE MAPS

**SHAFT  
URANIUM MINERALIZATION DEPOSIT  
OF ANY STRATIGRAPHIC HORIZON IN THE WESTWATER  
CANYON MEMBER.**

**NOTE: WESTWATER CANYON MEMBER IS  
REDUCED IN MOST OF THIS AREA.  
THERE HAS BEEN NO PRODUCTION  
FROM THESE DEPOSITS.**



Drafted by V.T. McLemore & K. Campbell

Revised December 1991